REPORT RESUMES

ED 003 326 24
A STUDY OF COLLEGE FRESHMEN--TWENTY-FIVE YEARS LATER.
BY- CAMPBELL, DAVID P.
MINNESOTA UNIV., MINNEAPOLIS
REPORT NUMBER CRP-2160 PUB DATE 65
EDRS PRICE MF-$0.27 HC-$5.24 131P.

DESCRIPTORS- *STUDENT RESEARCH, *INDIVIDUAL CHARACTERISTICS, *QUESTIONNAIRES, *INTEREST RESEARCH, ACADEMIC ACHIEVEMENT, INTELLECTUAL DEVELOPMENT, COMPARATIVE ANALYSIS, *COLLEGE STUDENTS, STUDENT IMPROVEMENT, GRADUATE STUDY, MINNEAPOLIS, MINNESOTA

A FOLLOWUP STUDY ON THE PROFILES OF INDIVIDUALS 25 YEARS AFTER THEY ENTERED COLLEGE IS REPORTED. APPROXIMATELY 650 INDIVIDUALS RESPONDED TO QUESTIONNAIRES. DATA WERE COLLECTED AND COLLATED, AND DESCRIPTIONS OF VARIOUS SUBGROUPS AND COMPARISONS BETWEEN THE GROUPS MADE OF SCHOLASTIC ABILITIES, ACADEMIC ACHIEVEMENT, INTERESTS AND ADJUSTMENTS, EMPLOYMENT, LIBERALS AND CONSERVATIVES, AND OVERALL ATTITUDES. IT WAS FOUND THAT TWO-THIRDS OF THE RESPONDENTS WERE GRADUATED FROM COLLEGE, 90 PERCENT WERE MARRIED AND AVERAGED 2 TO 3 CHILDREN, AND, AS A GROUP, WERE SUCCESSFUL. AN OVERWHELMING MAJORITY EXPRESSED SATISFACTION WITH THEIR JOB AND LIFE EXPERIENCES, AND EXPRESSED CONSERVATIVE VALUES 2 TO 1. (RS)

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

A STUDY OF COLLEGE FRESHMEN -- TWENTY-FIVE YEARS LATER

Cooperative Research Project No. 2160

David P. Campbell

University of Minnesota
Minneapolis, Minnesota

1963 - 1965

The research reported herein was supported by the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education, and Welfare.

ED 003326

FOREWORD

In an earlier project, also supported by the Cooperative Research Branch of the U.S. Office of Education, about 700 college students who attended the University of Minnesota during the 1930's were studied intensively to determine if there were any differences between a group who had received vocational counseling while at Minnesota and a comparable group who had not. The results of that research have been reported earlier. (Campbell, D. P., Twenty-Five Year Followup of Educational-Vocational Counseling. CRP #1346, May, 1964.)

The current report is essentially an extension of that earlier work as the results reported in the following chapters are based on the same sample of 700 students from the 1930's.

As before, I owe a substantial debt to the graduate and undergraduate research assistants who participated in this research, and to my colleagues at the Student Counseling Bureau for their assistance as judges for some of the ratings discussed in the text and for their always friendly and occasionally devastating criticisms of my methods.

Three graduate students have played especially important roles in this project: Charles Johansson, Jack Rossmann and Robert Thorpe. Their contribution is recognized, though inadequately, by listing them as co-authors of the chapters containing the research results for which they were primarily responsible. They deserve the lion's share of the credit for any analytic innovations in those chapters.

Mrs. Jean Forsberg, who typed the drafts and final copy, has my heart-felt thanks for her ability to organize and shape some very chaotic manuscripts.

David P. Campbell

June, 1965

CONTENTS

Page

FORWARD.. ii

CONTENTS... iii

LIST OF TABLES... vi

CHAPTER

1 AN OVERVIEW.. 1 - 3

The Williamson-Bordin Study................................ 1

The 1962 Followup of Counseling Effectiveness.............. 1

2 CROSS-SECTIONAL AND LONGITUDINAL COMPARISONS OF SCHOLASTIC ABILITIES OVER TWENTY-FIVE YEARS.............................. 4 -21

Method... 5

The Cross-Sectional Groups................................. 5

The Longitudinal Group..................................... 6

Results and Discussion..................................... 7

1962 Freshmen Versus 1933-36 Freshmen...................... 7

Adult Performance of 1933-36 Freshmen...................... 9

The Scholastic Abilities Growth Curve...................... 12

Mental Growth and College Attendance....................... 14

Correlations Between Tests and Grades Over 25 Years. 17

Conclusions and Implications............................... 20

3 AN ACADEMIC ACHIEVEMENT SCALE FOR THE STRONG VOCATIONAL INTEREST BLANK.. 22 -42

Earlier Work... 22

Methodology.. 25

Samples.. 25

Item Selection and Weighting............................... 27

Validity... 27

Reliability.. 31

Relationship Between Age and the ACH Scale............... 33

A Brief Summary to this Point............................ 34

Construct Validity....................................... 35

Correlates of the ACH Scale......................... 35

Scores of the SVIB Criterion Groups on the ACH Scale 37

Item Content.. 40

Summary.. 42

4 THE USE OF THE ACADEMIC ACHIEVEMENT SCALE..................... 43 -44

5 GOOD AND POOR STUDENTS 25 YEARS LATER......................... 45 -58

Differences in Ability and Achievement................... 47

The Minnesota Scholastic Aptitude Test (MSAT)....... 47

Degrees Earned...................................... 48

Family Income....................................... 48

Total Contribution to Society........................ 49

General Adjustment and Satisfaction...................... 50

Happiness with Home Situation....................... 50

Job and Occupational Satisfaction................... 51

Marital Happiness................................... 52

Overall Adjustment.................................. 53

Attitudes and Interests.................................. 55

Vocational Interests................................ 55

Other Attitudes..................................... 55

Occupations of the Top and Bottom Groups................. 56

Summary.. 57

INTRODUCTION TO CHAPTERS 6 AND 7................................. 59

6 EXPRESSED INTERESTS AND WORKER SATISFACTION.................. 60 -69

Method.. 61

Results and Discussion.................................... 62

Summary... 69

7 THE EMPLOYMENT OF MOTHERS WHO HAVE BEEN COLLEGE TRAINED....... 70 -84

Conceptual Framework...................................... 71

Methodology... 72

Findings.. 73

Facilitating Conditions............................... 74

Precipitating Conditions.............................. 75

Vocational Interests...................................... 78

Family Income... 81

Further Research.. 83

Summary... 84

8 LIBERALS AND CONSERVATIVES................................... 85 -112

Religion.. 88

Marital Status.. 88

Socio-Economic Level.................................. 88

Attitudes and Values.................................. 88

Mental Health... 90

Scholastic Aptitude and Achievement................... 92

Achievement Since College............................. 95

Vocational Interests of Liberals and Conservatives.. 97

Validity Results...................................... 100

Reliability... 106

Item Content.. 108

Personality and Occupation............................ 110

Liberals and Conservatives: A Summing Up.............. 110

LIST OF REFERENCES.. 113 -117

APPENDIX A.. 118 -121

LIST OF TABLES

Table | Page
1 Random Sample of 1962 Freshmen Versus Entire Class on MSAT Scores and High School Rank 6
2 Test Scores and High School Ranks for 1933-36 Freshmen and 1962 Freshmen 8
3 Twenty-Five Year Retest Group Versus Their Peers 10
4 MSAT Takers Versus Non-Takers in 25 Year Retest Group 11
5 Retest Group Versus Current Freshmen on MSAT 11
6 MSAT Test-Retest Results Over Varying Time Periods 13
7 Growth in Scholastic Abilities by Varying Educational Levels 15
8 Correlations Between Various Measures in Freshmen Classes 25 Years Apart 17
9 Correlations Between Various Measures Over Two Different Time Periods 18
10 Comparison of Validation and Cross-Validation Samples on Academic Achievement Measures 26
11 Intercorrelation Matrices 28
12 Correlations with Grade Point Average 29
13 ACH Scores and Degrees Earned 31
14 Test-Retest Reliabilities of the Achievement Scales Over 30 Days, 8 Years, and 22 Years 31
15 The Relationship Between Age and Scores on the ACH Scale 34
16 Correlations Between ACH and Other SVIB Scales Based on Scores of 191 Stanford University Seniors 36
17 Mean Scores on the ACH Scales for 55 Occupational Groups 38
18 Items Scored on Academic Achievement Scale 41
19 Scores on Academic Achievement Variables for Top and Bottom 10 Percent and Total Group 47
20 MSAT Raw Scores for Top and Bottom 10 Percent and Total Group 47
21 Highest Degree Level 48
22 Total Family Income 49

23 Contribution to Society Rating for Top and Bottom Group.............. 50

24 "When you were Growing Up, How Would you Describe your Feelings Toward Your Family and Home Situation?"............................ 51

25 Job and Occupation Satisfaction..................................... 51

26 Satisfaction with Marriage.. 52

27 Marital Adjustment.. 53

28 General Adjustment.. 54

29 Ladder of Life.. 54

30 Attitudes of Good and Poor Students................................. 55

31 Occupations of the Top and Bottom Groups............................ 56

32 Occupational Satisfaction Scores of the LIKE and UNLIKE Groups....... 62

33 Distribution of Responses to the Question: "Would you like your son to follow in your Occupation?"................................. 63

34 Distribution of Responses to the Question: "Is there some other kind of work you'd rather be doing?"................................ 63

35 General Life Satisfaction Scores "Ladder of Life"................... 64

36 Distribution of Responses to the Question: "Of which of your accomplishments are you most proud?"................................ 65

37 Distribution of Responses to the Question: "What aspects of your life give you the most satisfaction?"............................. 66

38 Comparison of Correlations of the Strong Vocational Interest Blank Congruency Ratings and Interview Question with Satisfaction Variables.. 68

39 Enabling Conditions... 74

40 Facilitating Conditions... 74

41 Precipitating Conditions.. 76

42 Means, Standard Deviations, and F Values on Occupational Scale Standard Scores of the SVIB for Women for Full-time, Part-time, and Non-employed Mothers.. 79

43 Precipitating Conditions with Income Controlled..................... 82

44 Designation of Criterion Groups..................................... 86

45 Liberals Versus Conservatives on Sociological Variables.............. 87

46 Comparison of Political Liberals and Conservatives on Attitudes and Values.. 89

47 Comparison of Political Liberals and Conservatives on Mental Health Variables.. 91

48 Political Liberals Versus Conservatives on Scholastic Ability and Achievement Variables.. 94

49 Percentage of Liberals and Conservatives Having Received Awards and Honors Since Leaving College............................... 95

50 Contribution to Society Rating Between Political Liberals and Conservatives.. 96

51 SVIB Scale Differences Between Liberals and Conservatives............ 98

52 Validities of the Liberalism-Conservatism Scales..................... 101

53 Average Scores for Macalester College Freshmen Males................. 103

54 Occupational Mean Scores on the Liberalism-Conservatism Scales....... 104

55 Test-Retest Reliability--Men's Scale................................. 107

56 Parent-Child Relationships on Ability and Achievement Variable....... 118

57 Migration, Abilities, and Achievements............................... 120

Chapter 1

AN OVERVIEW

This is the third in a series of research reports on a group of freshmen who entered the University of Minnesota in the years 1933 to 1936. The first two studies dealt with the counseling these students received, specifically, the short-term and long-term effects of that counseling.

The Williamson-Bordin Study

The first study, conducted by Williamson and Bordin (1940) identified a group of students who had come to the University's counseling center early in their freshman year to consult with a counselor about a vocational, educational, or personal problem. One year later, these students were matched with another group of students who had not sought counseling. The matching was done mainly on ability and background variables, such as high school rank, size of high school, sex, and so forth. During their sophomore years, both groups were followed up to determine if the counseling had had any effect.

In their report, Williamson and Bordin concluded that:

1. The counseled group had made a better adjustment to college as demonstrated by their happiness with their curriculum and general involvement in University affairs.
2. The counseled students were more successful academically as reflected by their significantly higher grades.

The 1962 Followup of Counseling Effectiveness

In 1962, this investigator set out to find these individuals and determine whether there was any discernable effect of counseling twenty-five years later. That research has been reported in an earlier report, also supported by the Cooperative Research Branch of the U. S. Office of Education under Project #1346. For more detail, the reader should consult that report.

The specific techniques of data collection were reported in the earlier report, and only a brief summary will be given here.

The first step in studying these students of twenty-five years ago was to find them and, surprisingly, virtuallv all of them were located, 762 of the 768 participants in the earlier study. Of these, 731 were still alive and each of them was asked to do four things. Those, and the percentage completing each, were:

1.	Complete a detailed 30 page questionnaire	84 percent
2.	Have an hour interview	90
3.	Complete the Strong Vocational Interest Blank	84
4.	Take the University's current entrance exam	87
5.	All four of the above	80
6.	At least one of the above	92

From these sources of information, the following conclusions were drawn.

1. There were substantial differences in all phases of academic achievement, favoring the counseled students. On measures such as total four year gradepoint, degrees earned, honors won, leadership positions held, and percent being elected to Phi Beta Kappa, large, impressive and statistically significant differences were noted in favor of the counseled students.

2. There were much smaller--indeed, faint--but detectable differences in adult achievement between the counseled and non-counseled students. Variables such as income, patents, civic awards, and rating on overall achievement showed small but consistent differences between the two groups again favoring the counseled students. This trend was most apparent among the men.

3. There were equally small but consistent differences on measures of adult satisfaction which favored the non-counseled students. Satisfaction with job, with marriage, with social life, and with life in general was usually higher among the non-counseled students, and this trend was particularly consistent among the women.

3. Twenty-five years later, two-thirds of the counseled students remembered seeing a counselor and three-fourths of them had favorable recollections. The remainder either didn't remember it, confused it with regular academic advising, or else

> remembered it but with neutral or negative feelings. Twenty-eight percent of the group recalled it as an important influence on their educational or occupational planning, while four percent felt that it had been definitely harmful.

The current study, reported in the following pages, began where the earlier ones left off. From the earlier studies a great deal of information was available on these individuals, both from their college years and from them as adults. In the following pages, an attempt has been made to develop some information about these people over a twenty-five year span. The counseled/non-counseled dichotomy has been abandoned; instead other categories, such as winners of different degrees, and holders of different political attitudes were established and differences between these categories were studied.

Essentially, this is a study of a group of individuals, all about 45 years old and all of whom entered the University of Minnesota's Liberal Arts College during 1933-35. When studied in 1962-64, they were spread all over the world though half of them remained in Minnesota; the other half were scattered widely with major concentrations in the large urban centers of the United States. Two-thirds of them eventually graduated from college, 90 percent have been married, and they have averaged about two or three children. As a group they have been successful, reporting an average income in 1962-63 of about $15,000. An over-whelming majority of them reported that they had jobs they liked and that, in general, they were satisfied with the way their life was going. The few exceptions, cases reporting extreme family difficulties, or financial pinches, or severe personal maladjustment only served to emphasize the generally high level of comfort in most of these lives. The following chapters include more detail on topics such as their abilities, satisfactions, and politics.

Chapter 2

CROSS-SECTIONAL AND LONGITUDINAL COMPARISONS OF SCHOLASTIC ABILITIES OVER TWENTY-FIVE YEARS

This chapter is concerned with two issues: first, how do college freshmen of the 1960's compare with those of the 1930's on college aptitude tests? and second, how well do freshmen of the 1930's, now about 45 years old, perform on current tests?

The comparison between freshmen of 25 years ago and freshmen of today is pertinent as there is a widely held opinion that, as more students are seeking a college education now, the quality of freshmen must be dropping. State universities are especially concerned as they see many top students from their states siphoned off by high-prestige liberal arts colleges, leaving them--so they suspect--with classes declining in ability. But evidence is accumulating (Berdie, Layton, Hagenah, and Swanson, 1962) that suggests college students today in a large state university are not inferior to students of past decades, and the data in this chapter add to that evidence.

The second question posed--"What happens to scholastic abilities as people grow older?"--also has an answer rooted in persistent popular opinion. Many people believe that individuals decline in their mental capacities as they move into adulthood--roughly past age 30. While there was some support for this view in the early cross-sectional studies of mental abilities (Jones and Conrad, 1933; Miles and Miles, 1932), several more recent longitudinal studies such as Nancy Bayley's work (Bayley, 1955), Terman's study of a gifted group (Terman and Oden, 1958), and Owens' longitudinal study of college freshmen (Owens, 1953), Charles' study of mentally retarded children over 15 years (Charles, 1953), and Swanson's study of bright high school seniors over a 25-year period (Swanson, 1953), indicate that the decreases in mental capacity found in the earlier cross-sectional studies were more likely attributable to the sampling methods used rather than any actual decline within the individual. These longitudinal studies of the same individuals over several years have shown no decline in mental abilities for age groups up to the 50's.

On both issues raised above, the results reported here are reassuring. The cross-sectional comparison between college freshmen of today versus those of the 1930's showed little difference between the groups, while the longitudinal comparison between the individual's test performance as a college freshman and his performance as an adult showed a great difference in favor of the adult.

Method

Several groups of people were used, all students from the College of Science, Literature, and the Arts (SLA) of the University of Minnesota.

The Cross-Sectional Groups

The first group included the entire freshman classes of 1933 and 1936. For the 1933 class, results were available for the 1933 College Aptitude Test, Form AM (1933 CAT). For the 1936 class, results were available for the 1936 American Council of Education Examination (1936 ACE). These tests were completed during the fall orientation program for entering freshmen.

The second group included freshmen who entered the University during the fall of 1962, roughly 25 years after the first group. During freshman orientation, a random sample of approximately 500 students took the two tests mentioned above, the 1933 CAT and the 1936 ACE. Scores for these students were also available on the University's current entrance examination, the Minnesota Scholastic Aptitude Test (MSAT), a derivative of the Ohio Series, authored by Layton and Toops. As this test was taken during the spring of the high school junior year, there was an 18 month lag between the MSAT and the other two tests.

Comparisons between this random sample and the entire 1962 class on both MSAT scores and High School Rank (HSR) are reported in Table 1 . Neither difference was statistically significant; the same was a representative one.

Table 1

Random Sample of 1962 Freshmen versus Entire Class on MSAT Scores and High School Rank

		MSAT		HSR	
	N	M	S.D.	M	S.D.
Random Sample 1962 Freshmen	476	46.7	12.6	74.2	19.6
1962 Freshman Class	3011	45.7	11.9	73.7	19.2

The Longitudinal Group

The third group were freshmen who entered the University during the 1930's and who were retested in 1962, i.e., the participants in the study of counseling effectiveness reported in the earlier report. . As part of that study, they were asked to take the MSAT, and those results are presented here.

The relevant descriptive data on this sample have been presented in the earlier report; generally, this group included 45 year-old people who entered the University of Minnesota about 25 years ago and who today agreed to take a college entrance examination. The group, predominantly urban dwellers living in 38 states and 9 countries, contained leaders in many areas: prominent public officials, well-known athletic coaches, bank presidents or vice-presidents, several college professors, company presidents, and also a few alcoholics and itinerants. Two-thirds of them were college graduates.

These, then, were the three main groups used in these comparisons: the entire freshman classes of 1933 and 1936, a random sample of 1962 freshmen, and a selected sample of 1933-36 freshmen, retested in 1962.

Results and Discussion

1962 Freshmen Versus 1933-36 Freshmen

The first comparison was made between the freshman classes of the 1930's and the freshmen classes of 1962. Those data are presented in Table 2 .

All of the differences between the means in Table 2 are significant beyond the one percent level but, as the data show, not in the same direction. The '36 ACE test and HSR slightly favored current freshmen while the '33 CAT favored freshmen of the thirties.

One hypotheses as to why the two tests gave different results was suggested by inspection of the item content. The 1936 ACE contains vocabulary, numerical, and symbolic items while the 1933 CAT is strictly a vocabulary test. Probably vocabulary materials become obsolete faster than numerical or symbolic materials. If this occurs, current freshmen would be handicapped and score relatively lower on the 1933 CAT than on the 1936 ACE.

Table 2

Test Scores and High School Ranks for 1933-1936 Freshmen and 1962 Freshmen

	1936 ACE		1933 CAT		High School Rank		
Percentile Points	1936 Freshmen	1962 Freshmen	1933 Freshmen	1962 Freshmen	1933 Freshmen	1936 Freshmen	1962 Freshmen
100	319+	329+	212+	207+			100
90	262	272	190	182	NOT		95
75	230	239	174	169	AVAILABLE		89
Median	197	201	154	152			78
25	162	173	128	132			61
10	137	150	102	109			45
1	99-	109-	71-	69-			17-
Mean	198	208	155	150	72	71	74
S.D.	48	47	30	29	23	24	20
N	1180	476	1193	476	1512	1050	476

A separate analysis of the subtests of the 1936 ACE gave mild support to this hypothesis. Though none of the differences were statistically significant, without exception the 1936 freshmen did better on the vocabulary subtests while the current freshmen did better on the numerical and symbolic subtests. Thus the slight superiority of earlier freshmen on the 1933 CAT was likely due to item content.

From the data in Table 2, it is clear that today's freshmen are not inferior to freshmen of the thirties--in fact they may be slightly superior. The increasing enrollment has not pushed quality down, at least in the

Liberal Arts College at the University of Minnesota. (As nearly as can be determined, admissions standards were not a factor in this comparison as they have been constant over the past 25 years--admitting roughly the upper 60 percent of Minnesota high school graduates.)

One possible explanation of how quality can be maintained in the face of rising numbers is suggested in some findings of Berdie and Hood (1963). They compared Minnesota High School seniors of 1950 and 1961, and found that the increase in college attendance among the very top high school students was three times (14 percent) as high as the average increase (5 percent). Proportionately, more of the good students of Minnesota were going to college compared with a decade earlier. Possibly this was due to the expansion and improvement of counseling facilities in Minnesota high schools where some informal screening occurs when the student is making his post-high school plans.

Whatever the cause, the results are clear: though there are more of them, college freshmen of today are as capable as college freshmen of the 1930's.

Adult Performance of 1933-36 Freshmen

How do freshmen of the mid-thirties, now about 45 years old, do on current scholastic aptitude tests? Because this retest group was not randomly selected, it was first necessary to determine how atypical it was. Data relevant to that determination are in Table 3 . Three groups are listed: first, the Williamson-Bordin group from the counseling effectiveness study, second, the entire Arts College freshman class of 1936, and third, a random sample of freshmen from 1933-36 drawn with the same composition of sex and year of entry as the Williamson-Bordin sample.

Table 3

Twenty-Five Year Retest Group Versus Their Peers

		CAT Percentile#		HSR Percentile	
	N	M	S.D.	M	S.D.
Williamson-Bordin Group	768	63	25.0	73	23.0
1936 SLA Freshmen	1050	63*	**	71	23.5
Random Sample 1933-1936 SLA Freshmen	713	57	26.7	68	24.5

# = College Aptitude Test Percentile based on all University of Minnesota Freshmen

** = Not Available

* = Percentile corresponding to raw score mean

While the differences were not large, they consistently favored the Williamson-Bordin group over either the entire single class or the sample drawn from the four classes. The Williamson-Bordin group was slightlv superior, by roughly 1/4 to 1/10 of a standard deviation, to their peers.

This difference was increased slightlv by the bias created by self-selection on the retest. Those who agreed to take the MSAT were slightly more able in their college years than those declining to participate. Table 4 compares the various subgroups on test scores, high school rank, and college grades from their student records of 25 years ago. The results indicate that the "MSAT takers" were slightly superior students twentv-five vears ago.

Table 4

MSAT Takers Versus Non-Takers

In 25 Year Retest Group

Groups	N	HSR Percentile		CAT Percentile		G. P. A.*	
		M	S.D.	M	S.D.	M	S.D.
MSAT Takers	634	74	22.3	63	24.9	2.17	.74
Refusals	97	72	24.1	58	26.0	2.12	.68
Unlocated	7	57	19.4	74	25.5	1.87	.67
Deceased	30	56	29.0	60	26.9	1.79	.79

---

* = Based on undergraduate record (A = 4.0)

The most remarkable difference to appear in this chapter was generated by the comparison on the MSAT between the 45 year old retest group and current freshmen tested as 16 year old high school juniors. Those data are presented in Table 5 .

Table 5

Retest Group

Versus Current Freshmen on MSAT

	N	M	S.D.
Retest Group (45 years old)	634	56.2	11.9
1962 Freshmen (Tested as H.S. Juniors at age 16)	3011	45.7	11.9

These two groups differ by almost a full standard deviation, a far bigger difference than could be explained by the non-random selectivity of the Williamson-Bordin group. Further, an inspection of the distributions suggests that this was an underestimate of the true difference as the MSAT did not have enough ceiling for the 25 year retest group. For example, though there are only 78 items on the MSAT, two percent of the group scored 75 or over. And although only 3 percent of the current freshmen scored above 70, 13 percent of the retest group did and they may well have scored higher, had they had the opportunity.

Clearly the older group scored much higher on today's scholastic aptitude test than current students do, though they--the retest group--were close to average in their own class 25 years ago. The conclusion is inevitable that individuals who attend college are brighter, or at least score higher on scholastic aptitude tests, at age 45 than age 16.

The Scholastic Abilities Growth Curve

This type of mental ability may mature at some earlier age and be waning or on some plateau by age 45. With only two points established on the curve, those at age 16 and 45, it is impossible to determine whether this ability is still rising, has leveled off, or is declining from some intervening peak.

Further data were collected to extend the MSAT growth curve to about age 20. In the fall of 1962, all students applying for advanced admission to the Arts College at Minnesota completed the Ohio State Psychological Examination #26, which has embedded within it all of the items of the MSAT. By comparing the student's performance as a high school junior with his performance on advanced admission, growth over this short period could be determined. Generally, these were students who had spent one, two or three years at some other school, frequently their local junior college, before coming to the University. A random sample of 1962 entering freshmen also completed the Ohio #26. The results of that testing are presented in Table 6 .

Table 6

MSAT Test-Retest Results

Over Varying Time Periods

H.S. Graduation Year		HSR		H.S. Jr. MSAT		1962 MSAT		Retest	MSAT
	N	M	S.D.	M	S.D.	M	S.D.	Interval (Months)	Growth
1959**	42	69	20.4	42.8	12.7	56.2	11.5	54	13.4
1960**	225	74	22.3	45.4	14.2	57.0	11.9	42	11.6
1961**	313	75	21.0	46.4	13.1	55.9	11.8	30	9.5
1962*	383	75	18.4	44.8	11.9	52.2	12.1	18	7.4

---

* = Random sample of entering freshmen

**= Students applying for advanced standing

Because these groups were not comparable on HSR and initial MSAT scores, growth on the MSAT rather than final score is the more meaningful statistic. It is reported in the last column of Table 6 . These figures, plotted against retest interval in months, indicate that the growth curve of these abilities followed a straight line during the college years for those students continuing on.

The magnitude of growth over the college years was slightly more than one standard deviation, a finding that closely agreed with the results of an earlier study by Laughlin at Minnesota (Laughlin, 1940). He retested 420 individuals after 3½ years of college with the Ohio State Psychological Examination #18, and found the average gain to be 1.2 standard deviation.

It should be noted here that the average growth found over 25 years in the retest group was also slightly more than one standard deviation. Thus, although these comparisons were confounded somewhat by the inadequate ceiling on the MSAT, it appears likely that most of the growth occurred during the college years.

A similar finding was reported by Owens in his study where he retested 127 men 30 years after they had been tested as college freshmen (Owens, 1953). He found considerable gains, and reported that these gains were probably achieved during the college years as opposed to later on in life.

Mental Growth and College Attendance

All of the data presented thus far were collected from college students, and it is not possible to determine if these gains would be found in a non-collegiate population. Some knowledge can be generated on this point by comparing gain scores between groups with differing amounts of college.

In Owens' study, he found that the groups with the most education showed the greatest gains. Swanson (1953), working with only individuals who were in the upper fifth of their high school class on grades and test scores, reporting the same trend; the groups with the most education showed the greatest gain. His results seem particularly meaningful as the groups were roughly equal in ability initially.

The data from the current study also support this hypotheses of growth connected with college attendance.

In Table 7 , the retest group has been divided by educational level. The first category includes individuals with less than two years of college, the next category has those with more than two years but less than a B.A., the third has those with a 4-year degree only, and the last includes individuals with some graduate study or professional degrees such as D.D.S., L.L.B., M.D., and all M.A.s and Ph.D.s. For these comparisons, only the individuals who had taken the 1936 ACE 25 years ago and the MSAT today were used.

Table 7

Growth in Scholastic Abilities

by Varying Educational Levels

Educational Level		1936 ACE		1962 MSAT		ACE Mean Z Score	MSAT Mean Z Score	GAIN Mean Z Score
	N	M	S.D.	M	S.D.			
Less than 2 Years	46	188.5	41.33	46.4	12.49	-0.43	-0.02	0.41
2-4 Years	34	188.5	40.20	54.1	10.91	-0.43	.59	1.01
B.A.	82	216.48	50.91	59.2	10.37	0.17	.99	0.82
Graduate Work	60	226.55	53.02	61.9	9.97	0.38	1.21	0.83

The first five columns in Table 7 show the number in each group and their scores on the two tests. The last three columns show the converted standard scores, and the gain between the two. (The mean and standard deviation of the 1962 freshmen group were used to establish these standard scores.)

The last column showing the gain from one test to the other is the pertinent one. These results show a mild trend toward more growth with more education, which might even be more pronounced were it not for the restrictive ceiling on the MSAT. The group with the most education, the graduate group, started highest on the earlier test but could not show much relative improvement on the MSAT as their adult average, 62, was only one and one-half standard deviations below the highest possible score. Had they had the opportunity they very likely would have demonstrated a larger increase. This conjecture was strengthened by the variability data on the two tests. On the 1936 ACE, the variability increased from group to group up the educational ladder, but on the MSAT the variability decreased, probably because some of the higher individuals were held down by the ceiling.

Attention should be drawn to the size of the differences between these groups. On their 1936 ACE scores as entering freshmen, there was roughly 3/4 of a standard deviation difference (188 to 226) between those never graduating and those eventually doing graduate work. That difference in itself was large and significant, but the current difference on the MSAT, averaging about 1¼ standard deviations, was even more impressive, (47 to 62). Clearly, though both of these groups have improved, the graduate group has gained more and the difference between them has widened.

These data, together with the work of Owens and Swanson, demonstrate that growth in these abilities is associated with college attendance, though they do not prove which is cause and which effect. Education may foster this increased growth or, alternatively, people who develop most may seek more education. From this study, it is impossible to tell which is happening, but some combination of factors would seem most plausible.

Correlations Between Tests and Grades Over 25 Years

One other area explored in this chapter was the stability over several years of the relationship between various indices of academic ability, and the effect of time on the accuracy of prediction of these indices.

Correlations between various measures in two groups separated by 25 years are presented in Table 8. For example, the first row shows the correlation between high school rank and first quarter grade point for the 1962 freshmen and for freshmen of the thirties. Obviously the relationship between high school grades and college grades has remained stable. The other correlations in the table show the same trend.

Table 8

Correlations Between Various Measures in Freshmen Classes 25 Years Apart

Variables	Classes	
	1962 Freshmen*	1933-36 Freshmen**
G.P.A. # vs. H.S.R.	.47	.52
G.P.A. # vs. 1936 A.C.E.	.53	.52
G.P.A. # vs. 1933 C.A.T.	.40	.33
H.S.R. vs. 1936 A.C.E.	.44	.37
H.S.R. vs. 1933 C.A.T.	.30	.14

---

* = N=476

** = N's vary from 262-601

# = First Quarter Only

Another indication of the stability of these measures is the comparison of correlations between measures collected at different points in time. These correlations are shown in Table 9 , and again they indicate great stability. These figures show that the correlation between measures collected 25 years apart are virtually identical to correlations between those collected just 18 months apart.

Table 9

Correlations Between Various Measures

Over Two Different Time Periods

Variables	Time Lag Between Measures 18 Months*	 25 Years**
	"r"	"r"
1st Qtr. G.P.A. vs. MSAT	.51	.48
HSR vs. MSAT	.34	.34
1936 ACE vs. MSAT	.74	.70
1933 CAT vs. MSAT	.61	.51

---

* = 1962 Freshmen, N = 476

**= 1930's Freshmen, N's vary from 214-602

The stability of these correlations, coupled with the earlier figures showing growth of the individuals, leads to the conclusion that though the group as a whole advanced upward, the rank order of individuals within the group remained fairly constant. This conclusion was strengthened by a scatter-chart showing the 25 year retest group scores then against their scores now. High people stayed high; low people stayed low, though there were some substantial increases in individual cases. This point should probably be emphasized for the enlightenment of any administrators or institutions who make irreversible decisions on the basis of test scores alone. The quarter of the scatter chart showing cases "high then-low now" is virtually vacant. The quarter showing "low then-high now" has a healthy number of cases while, of course, the most populous quarters are those of "low then-low now" and, "high then-high now".

One very disconcerting finding was the demonstration that there has been no progress in accuracy of grade point prediction since 1936. The correlation between the 1936 ACE and 1st quarter GPA for 1936 freshmen was .52, and for 1962 freshmen, .53; the correlation between the MSAT, the University's 1962 entrance examination, and first quarter GPA for 1962 freshmen was .51. It is disturbing to note that at the University of Minnesota, an institution greatly interested in better student personnel administration, during the active years of extremely able people such as D. G. Paterson, E. G. Williamson, J. G. Darley, R. F. Berdie, and others of high capabilities, it has not been possible to increase even slightly the accuracy of student selection procedures. While there may be arguments which attempt to rationalize this lack of progress ("Grades are not a truly important criterion", "We know much more about working with the individual student once he is here.") the cold, hard fact remains that superior or inferior students are no more accurately identified today by the University's admissions test than they were 25 years ago. (It perhaps should be pointed out here that current scholastic aptitude tests are shorter, easier to administer, and less complicated to score than earlier versions. The same degree of accuracy is attained more simply now but that is small consolation for lack of real improvement in accuracy.)

Apparently the variance in college grades due to scholastic abilities has been adequately tapped. Motivation, study habits, personal involvement, a desire to achieve goals other than grades--these and other factors probably account for the remaining variance and no psychological instrument available thus far measures these well. In a much earlier article, E. G. Williamson has pointed out all of this (Williamson, 1937). Still, there has been little real progress. A breakthrough is needed.

Conclusions and Implications

The results of the comparisons reported in this chapter support five main conclusions:

1) In scholastic abilities, the 1962 freshman class at the University of Minnesota was at least equal and possibly slightly superior to the freshmen of the mid-thirties.
2) Individuals score far higher on scholastic aptitude tests at age 45 than at age 16.
3) Growth on scholastic ability tests is associated with length of college attendance.
4) The relationships between the various measures of academic ability and achievement, such as aptitude tests, high school grades, and college grades are very stable over long periods of time.
5) There has been no improvement in the accuracy of prediction of student performance over the last 25 years.

The implications of these conclusions seem both straightforward and, for the most part, reassuring. Those implications are:

First, though many more people come to college today (the percentage of Minnesota students continuing on to college has roughly doubled during the past twenty-five years), the quality has not dropped, at least as measured by test performances. Whether this is due to a general improvement in the population or better selection of students is not clear; perhaps a combination of both factors is working. Whatever the reason, college faculties today have raw materials equal in quality to those of 25 years ago.

Second, though these data leave a considerable gap in the growth curve from the end of college to age 45, they do indicate that the average 45-year-old does as well as the average college senior. Whether the 45-year-old stopped improving at the end of college, or whether he is declining from some intervening peak is not clear.

Third, if we are willing to accept the assumption that the growth associated with college attendance was caused, at least to some extent, by that attendance, these results offer evidence of the value of education in fostering mental growth, and an empirical foundation for the assertion that one way of upgrading the populace is to educate them.

Last is the disquieting conclusion that we have made no progress in accuracy of grade-point prediction over the past twenty-five years. This surely qualifies as a plateau and, as so often has proved true in other endeavors, to advance upward once more, we need to try radically new methods.

Chapter 3

AN ACADEMIC ACHIEVEMENT SCALE FOR THE STRONG VOCATIONAL INTEREST BLANK

Co-authored with Charles Johansson

Date presented in the preceding chapter indicated very clearly that we have made no progress in accuracy of grade-point prediction in the last twenty-five years. The work reported in this chapter was an attempt to improve this situation by using an interest inventory in the prediction equation. As will be seen, we were moderately successful in developing an interest inventory scale to predict college grades, but this scale did not add appreciably to a multiple correlation using high school grades and an ability test as the independent variables and college grades as the dependent variable.

The scale itself, however, proved to be an interesting measure; a substantial amount of information was accumulated about it and is reported in the following pages. Hopefully, the scale will prove to be a useful tool in college settings.

Earlier Work

Attempts to predict college grades using the Strong Vocational Interest Blank (SVIB) started in the 1930's. Two early investigators, Young and Estabrooks (1936) developed a SVIB scale which attempted to differentiate between a studious group and a non-studious group. The studiousness of a subject was determined by the following formula:

$$SI = GPA - r_{IG}\, I$$

SI = Studiousness Index
GPA = Grade Point Average
I = Intelligence as measured by the ACE Psychological Examination
r_{IG} = Correlation between grades and intelligence

The responses to the SVIB for a studious and a nonstudious group were analyzed, and a scale was developed by weighting the responses according to the probability that the difference between the two groups was a true difference. Thus, an index was derived which, they hypothesized, would measure factors not measured by intelligence.

Young and Estabrooks reported the validity of their scale for five cross-validation samples of males in college (1937). The scale correlated, at best, .35 with grades and increased the correlation between the ACE and grade point average from .30 to .42, .50 to .56, .39 to .55, .54 to .60, and .55 to .61, respectively in five samples when the multiple correlation was used.

Charles Mosier (1937) used Young and Estabrooks' scale at the University of Florida. His results showed that the scale was valid for liberal arts students (r = .47) but not for students in the technical schools (r = .24), or in the School of Business Administration (r = .05).

Williamson (1937), using two different samples of University of Minnesota freshmen, found that the Young-Estabrooks scale made a contribution to a multiple correlation using a college aptitude test of about the same magnitude reported by Young and Estabrooks in their cross-validation samples. However, the scale did not contribute any more to predictive validity than that contributed by high school percentile rank. Williamson (1938) later found a negligible increase over ACE alone and no increase over high school grades when using the studious scale to predict college grades.

Martin (1964), working at the University of Pittsburg, has recently developed an SVIB scale to predict college achievement using a procedure different from Young and Estabrooks. She collapsed the three responses per item into artificial dichotomies, then used the point-biserial correlation to correlate these dichotomies with an index of college achievement. Her index was similar to that of Young and Estabrooks; using the College Aptitude Test and High School quintile rank as predictors, the predicted quality point average (QPA) was subtracted from the actual QPA. If the correlation between the index and the item dichotomies was significantly different from zero at the .10 level or less, the item was unit weighted, using various patterns. Her best scale correlated .29 with QPA in her cross-validation samples and added .07, .06, .05, .05, .03, .00 to the multiple correlation in various samples when used with aptitude and high school rank predictors. The magnitudes of the multiple correlations were about the same as those reported by Young and Estabrooks.

The scale developed in this study differs in two ways from earlier scales. First, it was developed by using recently established item analysis methods for interest inventory items, methods which pay more attention to the magnitude of the difference between two groups rather than simply to statistical significance.

Second, we have used criterion groups composed of those who make good grades versus those who make poor grades--with no correction for either ability or past performance. This correction approach has not worked in the earlier studies so it was not used here. Instead, we simply tried to isolate an "Academic Achievement" dimension within a pool of interest items. If such can be located, it will be helpful in understanding the composition of interests within the individual, even though it may not add further predictive power to our methods.

Methodology

Samples

In the fall of 1961, 1381 male freshmen entered the College of Science, Literature, and the Arts (SLA) at the University of Minnesota. Several items of information are available on each of these students: their high school rank (HSR), score on the Minnesota Scholastic Aptitude Test (MSAT) taken during their junior year in high school, and first year college grade point average (GPA). For 712 of them, results from the Strong Vocational Interest Blank (SVIB), taken just prior to their entering college, were available.

The sample of 712 males who had taken the SVIB was split into two groups: a validation group of 462 and another group of 250 which was held out for a cross-validation sample.

A second cross-validation sample was available, consisting of 283 adult males who were students at the University of Minnesota during the 1930's, the participants in the counseling effectiveness study described earlier. They took the SVIB and MSAT during 1962 during the followup study; thus there was an interim of 25 years between their academic life and the time they took the SVIB. (This group was initially used as the validation sample but we found that scales developed on them did not work very well with current freshmen so we started again, using current freshmen as the subjects. While the 25 year followup sample is the main subject of this report, the intent of the research reported in this chapter was to understand the relationship between interests and academic achievement among college students so we used the data which seemed most promising, i.e., those gathered from current students.

Table 10

Comparison of Validation and Cross-Validation Samples

on Academic Achievement Measures

	1961 Freshmen Validation (N=462)		1961 Freshmen Cross-Validation (N=250)		1961 Freshmen No SVIB (N=669)		25 Year Followup (N=283)	
	M	S.D.	M	S.D.	M	S.D.	M	S.D.
1st Yr GPA*	1.9	.80	1.9	.89	1.8	.83	2.1#	.75#
MSAT	43.4	11.8	43.8	11.3	43.4	12.2	57.7	11.3
HSR	71.6	19.4	70.6	20.9	68.4	21.5	69.9	23.2

* A = 4.0

# Based on entire undergraduate GPA

Table 10 presents the ability and achievement measures of the samples described. An analysis of variance of three groups of entering freshmen, validation, cross-validation, and no-SVIB groups, showed no significant differences on HSR, GPA, or MSAT. However, when the 25 year followup sample was included in the analysis, there were significant differences at the .01 level for both GPA and MSAT. These differences are readily explainable. The twenty-five year followup group was selected, in the main, from students who had completed one year of college, and such a group would have slightly better grades than freshman in general. Concerning the MSAT, the 25 year followup group was tested as adults and, as noted in the preceding chapter scored much higher than the teenagers.

However, these differences did not contaminate the development of the scale since the adult group was only used as a cross-validation sample to determine the correlation between college grades and the score on the achievement scale.

Item Selection and Weighting

To develop a scale related to academic achievement, an index based on a combination of both HSR and GPA was calculated for each subject in the validation sample. This index was derived by multiplying GPA by 25 (so that its variance and range approximately equaled that of HSR) and adding this product to HSR. Then the item response frequencies of the SVIB for the top 40 percent and the low 40 percent were compared. Response positions showing 13.5 percent differences or greater were selected for inclusion in the Achievement Scale. If the difference favored the high achieving group, the response was weighted plus one. Differences favoring the low achievers were weighted minus one. Only those 298 items which are common to the old and the revised male SVIB were considered.

After developing this scale, (called ACH') another scale was generated from it. All items were conceptualized as a continuous dimension so that if one end of the item (either L or D) was weighted plus one or minus one, then the other extreme (the opposing D or L response), was weighted in the opposite direction. For example, if the L response for item 300 was weighted +1 on scale ACH', then the L response is weighted +1 and the D response is weighted -1 on the new scale, which will be referred to as achievement (ACH). All items in which only the I response was weighted remained the same. Using this method the number of weighted items was 55 for both scales, but the number of weighted responses was increased from 85 to 120. (The item weights developed in this manner are reported later in Table 18)

Validity

The freshmen samples and the 25-year followup sample were scored, using the two scales, and correlations between the achievement scales, HSR, MSAT, and GPA were computed. Those data are presented in Table 11.

They show that the two achievement scales correlate very highly with each other (.98) and, for the validation sample, they were the best single predictors of grade point average. (.53 and .52) However, there was considerable shrinkage in both cross-validation samples for the achievement scales (.36 and .35; .36 and .36) and high school rank became the best predictor (.55 and .46).

Table 11

Intercorrelation Matrixes

1961 Validation Freshmen (N = 462)

	ACH	MSAT	HSR	GPA	M	S.D.
ACH'	.98	.40	.50	.53	3.4	11.8
ACH		.38	.48	.52	0.6	14.4
MSAT			.24	.37	43.4	11.8
HSR				.48	71.6	19.4
GPA					1.9	.8

1961 Cross-Validation Freshmen (N = 250)

	ACH	MSAT	HSR	GPA	M	S.D.
ACH'	.98	.22	.33	.36	5.0	10.3
ACH		.23	.32	.36	2.8	12.5
MSAT			.27	.41	43.8	11.3
HSR				.55	70.6	20.9
GPA					1.9	.9

25-Year Followup Cross-Validation Sample (N = 283)

	ACH	MSAT	HSR	GPA	M	S.D.
ACH'	.97	.28	.23	.36	9.3	10.0
ACH		.30	.24	.35	7.7	12.2
MSAT			.29	.44	57.7	11.3
HSR				.46	69.9	23.2
GPA					2.1	.8

Multiple correlations were computed using grade point average as the dependent variable and the ACH scales, HSR, and MSAT as independent variables. These figures are reported in Table 12.

Table 12

Correlations with Grade Point Average

Predictors	Samples 1961 Freshmen Validation (N=462)	1961 Freshmen Cross-Validation (N=250)	Total 1961 Freshmen (N=712)	25-Year Followup 2nd Cross-Validation (N=283)
ACH'	.53	.36	.47	.36
ACH', MSAT	.56	.49	.52	.50
ACH', HSR	.57	.58	.58	.53
ACH', MSAT, HSR	.61	.63	.61	.59
ACH	.52	.36	.46	.35
ACH, MSAT	.55	.49	.52	.50
ACH, HSR	.59	.59	.58	.52
ACH, MSAT, HSR	.61	.63	.61	.59
MSAT	.37	.41	.38	.44
HSR	.48	.55	.51	.46
HSR, MSAT	.55	.62	.57	.56
(MSAT, ACH) - (MSAT)	.18	.08	.14	.06
(HSR, ACH) - (HSR)	.11	.04	.07	.06
(ACH, MSAT, HSR) - (MSAT, HSR)	.06	.01	.04	.03

Inspection of the cross-validation samples shows that when the achievement score is added to either HSR or MSAT, it increases the correlation with GPA about .06. However, the gain in adding the ACH scale to the combined predictability of both MSAT and HSR was negligible. Whatever variance is tapped by the ACH scales is measured equally well with the MSAT and HSR.

Still, the scale is moderately valid when used alone or with one of the other measures and as, intuitively at least, it seems to be a different way of measuring "grade-getting behavior"--HSR deals with past performance, MSAT deals with scholastic ability, while the ACH scales are based on measures of interest--we carried out further analysis to better understand this measure.

To make interpretation easier, scores on this scale have been converted to standard scores with a mean of 50 and standard deviation of 10. (As reported below, the ACH' scale proved less reliable than the ACH scale (item dimension model) so it was dropped from these further analyses.) The norm group used to establish this conversion was a sample of Stanford University graduates of about 1932. Thus, a score of 50 represents the average score for a group of successful college students, successful in the sense of graduation from college.

Specifically, each raw score is converted to a standard score by the following formula:

$$\text{Standard Score} = \left(\frac{X - M_{SG}}{S.D._{SG}} \right) 10 + 50$$

Where X = Raw Score

M_{SG} = Mean, Stanford Grads = 9.5

$S.D._{SG}$ = Standard Deviation, Stanford Grads = 10.26

Further evidence of the validity of the ACH scale was gathered by comparing the mean scores of groups from the twenty-five year followup sample who had earned different college degrees. Those data, presented in Table 13, show a very nice progression from low scores among individuals who earned no degrees to high scores for those who earned the Ph.D. The average undergraduate grade point for each of those groups is also listed and, with the exception of the small group of dentists, the grades show the same progression.

The magnitude of these differences on the ACH scale was large enough to be practically worthwhile. There was almost a full standard deviation between the Ph.D.s and the B.A.s--with the M.A.s falling half-way in between--and about a half standard deviation difference between the B.A.s and those who dropped out before earning a degree.

Table 13

ACH Scores and Degrees Earned

Degree	N	M	S.D.	Undergraduate GPA*
Ph.D.	16	57.5	12.9	2.9
D.D.S.	7	56.5	3.9	2.4
M.D.	26	56.1	12.6	2.7
L.L.B.	21	53.1	10.1	2.5
M.A.	27	52.2	12.3	2.5
B.A.	101	47.4	11.0	2.4
None	85	42.5	9.7	1.7

* Based on all individuals earning specified degree in 25 year followup sample

Note that the Minnesota graduates averaged approximately the same as the Stanford graduates. To make a direct comparison we would have to know how many advanced degree earners were included in the Stanford group, and that information is not available.

Reliability

The test-retest reliabilities for the two ACH scales are presented in Table 14 for three groups of college educated males, tested and retested over differing time intervals.

Table 14

Test-Retest Reliabilities of the Achievement Scales

over 30 Days, 8 Years, and 22 Years[a]

	ACH'					ACH				
	Test			Retest		Test			Retest	
Test-Retest Samples	r_{xx}	M	S.D.	M	S.D.	r_{xx}	M	S.D.	M	S.D.
30-Day (N=102)	.84	8.8	9.5	8.2	10.1	.88	7.2	11.8	6.4	12.7
8-Year (N=171)	.56	3.5	9.4	11.8	9.9	.59	0.3	11.6	10.6	12.3
22-Year (N=191)	.63	11.4	8.1	13.6	8.3	.66	9.4	10.1	12.6	10.3

a = All scores reported in raw score form

The first group, who took the SVIB twice within an interim of thirty days, consisted of men roughly 25 years old, from an U.S. Army Reserve unit. The second group was tested first as Minnesota high school seniors and retested about eight years later, 3 or 4 years after they had graduated from the University of Minnesota. The last group took the test as college seniors at Stanford University and were retested by E. K. Strong, Jr. twenty-two years later.

Although the table does not show a perfect monotonic function between test-retest interval and reliability, the reliabilities for thirty days and twenty-two years show about the same stability as the other scales on the SVIB; the mean correlation of the sixty other SVIB scales for the 30-day and 22-year groups are .89 and .64 respectively.

Other research has shown that results on the SVIB are less stable for teenagers than for young adults and these results are consistent with those findings. The eight year test-retest sample included younger people--average age about 17 at first testing--than either the 30 day sample --age about 25--or the 22 year sample --age about 21 -- at first testing.

In all cases, ACH (the item dimension scale) was more reliable than ACH'. Although treating each item as a miniature dimension and weighting both extremes did not affect the validity either favorably or unfavorably (see Tables 11 and 12), it definitely added some increment to the scale reliability.

For these reasons, in the remainder of this report only the ACH (item dimension) scale will be considered.

Relationship Between Age and the ACH Scale

The mean changes over time within each test-retest sample in Table 14 should be noted. The change was slight within the 30 day group, very large--almost one standard deviation--within the 8 year group, and mild--about one third standard deviation--within the 22 year group. Such a pattern indicates that the developmental period between test and retest might be more important than the length of the period. The subjects in the 8 year retest group were considerably younger (about age 17) when initially tested than those in the other two groups, indicating that developmental changes in late adolescence might account for the instability noted in this retest group.

An age growth curve was generated by using both the eight year and twenty-two year retest groups. As a five year retest was also available for the 22 year group, several points on the scale could be established by using these samples.

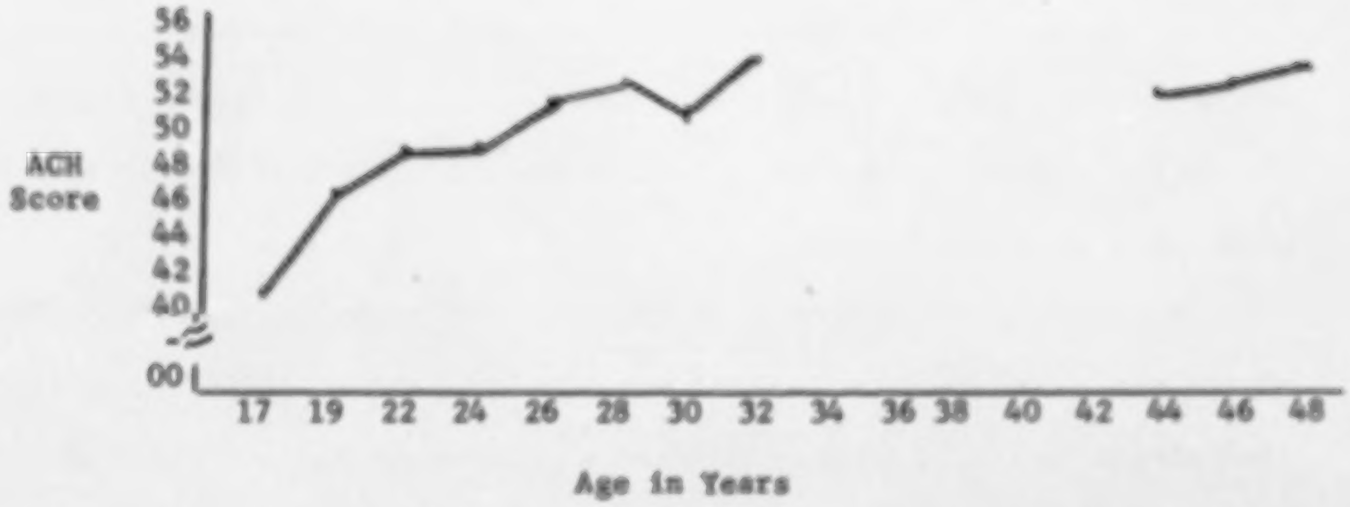
The results are presented in Table 15. The graphical representation of the data, presented in the bottom half of the table, indicates an initial rise around age 20, a further mild increase to about age 30, then--though there is a large gap in our curve--a probable leveling off which continues at least through the late 40's.

It appears that the type of interest tapped by this scale increases most during those years when the individual is closely involved with the academic enterprise. Further evidence presented later in this chapter (page 38) indicates that it is not passage of time that affects the scores as much as it is level of education. The correlation between age and ACH score over several occupational samples was only .17 while the correlation between level of education and ACH score was .81.

Table 15

The Relationship Between Age and Scores on the ACH Scale

Age	N	Mean
17-18	141	41.45
19-21	27	46.79
22-23	90	49.17
24-25	104	49.01
26-27	133	51.87
28-29	169	53.27
30-31	49	50.89
32-33	36	54.81
44-45	54	52.59
46-47	65	53.52
48-49	26	54.18



Whether this type of interest leads one to seek more education or whether increased education changes one's interests cannot be determined from our data. It is not unlikely that, for different individuals, both explanations are appropriate.

A Brief Summary to this Point

> An Academic Achievement (ACH) Scale has been developed which correlates moderately with grades (r_x = .36 in a cross-valiation sample). But though its correlation with other measures of academic aptitude is only moderate, about .35, the ACH does not seem to tap any, or at least very much, unique variance in college grades.
>
> The scale is reliable, especially over short time periods, and over long time periods with adults. Scores do increase during the college years.

Construct Validity

While we have reported the development of a reliable, moderately valid scale, we still have not established anything of the nature of the scale itself. If the scale is to be useful in applied situations such as counseling and guidance settings, the user needs to know more about the flavor of the measure. Shrewd clinical utilizations of such a scale depend more on construct validity than on concurrent or predictive validity.

In this section we are trying to ascertain what the scale means, first, by studying its correlates, second, by looking at the average scores of several occupational groups on the scale, and third by looking at the items themselves.

Correlates of the ACH Scale

Earlier, in Table 11, correlations between this scale and high school rank, and college aptitude test scores were reported. They were positive, though moderate in size, indicating that good students and bright students tend to have more of such interests, whatever they are, than do duller, poorer students.

The correlations between the ACH scale and the other scales on the SVIB are reported in Table 16. These correlations are based on the scores of a sample of 191 Stanford University seniors who graduated in 1927. The scale means for this group are also reported in Table 16, and they indicate a relatively flat group profile. This group was chosen for the correlation analyses because of this flat profile. In another group, for example, accountants, the group might score high on both the accountant and ACH scale, thus artificially producing a high correlation even though the scales are in reality unrelated.

Table 16

Correlations Between ACH and Other SVIB Scales

Based on Scores of 191 Stanford University Seniors

Scale	Correlation	Mean	Standard Deviation
Biologist	.69	20	12.0
Mathematician	.62	28	11.8
Psychologist	.59	28	10.6
Psychiatrist	.57	31	9.6
Physicist	.56	20	16.0
Physician	.52	34	14.2
Chemist	.52	34	14.6
Librarian	.50	28	10.8
Engineer	.42	34	13.8
Music Performer	.42	34	8.7
Architect	.40	28	11.4
Math-Science Teacher	.39	36	12.5
Dentist	.35	30	13.1
Minister	.33	25	12.9
Artist	.32	26	10.9
C.P.A. Owner	.31	28	10.2
Art Teacher	.27	17	10.6
Music Teacher	.20	16	10.7
Liberalism-Conservatism	.20	50	9.1
Osteopath	.19	30	13.0
School Superintendent	.19	29	13.3
Optometrist	.17	27	11.0
Physical Therapist	.17	26	12.1
Occupational Level	.17	59	6.6
Author-Journalist	.15	33	9.2
Interest Maturity	.07	59	6.4
Rehabilitation Counselor	.05	27	10.0
Social Worker	.05	25	11.6
Accountant	.05	31	11.3
Public Administrator	.04	35	10.2
Senior C.P.A.	.04	31	9.8
Forest Service	.03	25	13.0
Y.M.C.A. Physical Director	.02	25	12.7
Vocational Counselor	.00	31	11.0
Lawyer	-.01	38	11.0
Carpenter	-.02	16	12.8
Aviator	-.02	30	12.7
Pharmacist	-.03	23	9.0
Army Officer	-.04	24	12.4
Y.M.C.A. Secretary	-.05	23	12.9
Veterinarian	-.06	19	10.8
Farmer	-.06	33	10.2
Advertising Man	-.07	31	9.8
Personnel Director	-.10	34	11.7
Production Manager	-.11	33	9.7
Social Science Teacher	-.13	31	13.6
Business Education Teacher	-.16	26	12.0
Printer	-.16	28	8.9
Policeman	-.16	28	9.0

Table 16(Cont'd)

Scale	Correlation	Mean	Standard Deviation
Chamber of Commerce Exec.	-.22	30	10.9
Masculinity-Femininity	-.22	46	9.1
Office Worker	-.22	33	10.3
President-Manufacturing Concern	-.24	22	11.2
Credit Manager	-.27	29	11.5
Life Insurance Salesman	-.42	28	11.5
Sales Manager	-.42	28	10.6
Funeral Director	-.53	24	9.6
Banker	-.54	23	10.3
Purchasing Agent	-.56	26	11.1
Real Estate Salesman	-.65	33	9.2

The correlations in Table 16 reflect a "Science versus Sales" dimension. The high correlations--toward the science end--also include correlations with occupational scales representing the interests of the more creative occupations, such as Musician Performer, Architect, Artist and Art Teacher. The Social Service occupational scales correlate low positive with this scale, the Technical and Skilled Trades scales low negative.

The high negative correlations--toward the Sales End--include occupational scales representing the interests of general business occupations.

Scores of the SVIB Criterion Groups on the ACH Scale

While correlations between scales are valuable, they can be misleading as they depend on rank ordering, not mean differences. Just because the ACH scale has a high negative correlation with the SVIB Real Estate Salesman scale (indicating that, within this group of Stanford seniors, those who rank high on one scale rank low on the other), one cannot conclude necessarily that real estate salesmen score low on this scale. That question can only be answered by actually scoring the salesmen on the ACH scale.

Mean scores for each of the SVIB occupational criterion groups are reported in Table 17. These groups, used to establish the occupational scales of the SVIB, are described more fully in the SVIB Manual (Strong, 1962).

For the most part they include individuals from each occupation, between the ages of 25 and 55, who have been employed in the occupation at least three years, are at least minimumly successful and satisfied with their work.

Table 17

Mean Scores on the ACH Scales for 55 Occupational Groups

Occupational Groups	N	Mean	S.D.	Mean Age	Mean Education	
Biologist	342	60.7	8.9	46.3	M.A.+	Scientific
Mathematician	181	60.4	7.0	46.1	18.8	
Psychiatrist	401	60.0	8.9	39.3	M.D.+	
Physicist	167	59.2	6.7	43.2	18.5	
Psychologist	1045	57.7	8.9	44.0	Ph.D.	
Librarian	425	57.2	8.7	40.2	17.3	
Chemist	292	54.3	9.2	35.2	16.8	
Physician	532	54.2	10.3	40.9	M.D.	
Superintendent	189	51.7	8.5	46.5	16.9	Help Others
Music Teacher	490	51.4	8.6	41.4	17.0	
Minister	249	51.2	9.1	42.6	18.2	
Rehabilitation Counselor	272	51.1	11.0	50.4	17.5	
C.P.A. Owner	353	50.4	10.0	37.3	14.3	
Social Worker	400	50.1	10.4	39.0	18.3	
Physical Therapist	348	49.4	10.0	32.8	16.5	
Math-Science Teacher	288	49.3	9.1	33.6	16.4	
Architect	238	49.1	10.0	42.8	14.4	Misc.
Engineer	511	48.7	9.0	43.9	15.4	
Vocational Counselor	275	48.6	9.7	--	--	
Author-Journalist	242	48.3	9.6	45.0	14.3	
Public Administrator	534	48.2	10.6	--	--	
Lawyer	249	47.8	9.8	39.2	17.0	
Music Performer	441	47.7	11.3	36.4	13.6	
Senior C.P.A.	611	47.7	10.1	37.7	14.4	
Army Officer	463	47.6	9.1	29.3	--	
Osteopath	584	47.5	9.9	37.8	15.8	
Artist	218	46.7	10.2	42.7	11.9	
Dentist	235	46.7	10.3	42.4	14.9	
Personnel Director	147	45.8	9.6	41.0	--	
Pharmacist	292	45.8	9.6	41.2	--	
YMCA Physical Director	213	45.4	9.4	31.4	14.0	
YMCA Secretary	113	45.2	8.4	42.0	14.4	
Accountant	343	44.9	9.5	37.4	12.3	Business
Chamber of Commerce Exec.	399	44.7	11.0	40.1	15.5	
Credit Manager	452	44.6	9.8	43.2	14.9	
Business Education Teacher	322	44.0	9.9	40.3	16.8	
Men-In-General (Strong's Group)	498	43.7	11.0	--	--	
Social Science Teacher	217	43.6	9.7	33.7	16.4	

Table 17 (Cont'd)

Occupational Groups	N	Mean	S.D.	Mean Age	Mean Education	
Production Manager	212	42.9	9.4	42.8	13.3	
President-Manufacturing Concern	165	42.7	9.4	48.0	13.1	Business (Cont'd)
Advertising Manager	167	42.6	9.2	37.6	14.0	
Veterinarian	310	42.5	9.7	44.4	D.V.M.	
Office Worker	316	41.4	9.3	33.2	11.5	
Aviator	509	41.4	9.7	--	--	
Forest Service Men	406	41.4	9.4	38.5	14.2	
Policemen	251	40.4	9.6	34.8	10.4	Outdoors
Life Insurance Salesmen	310	40.3	9.8	39.9	13.6	
Farmer	240	40.1	10.3	37.6	14.6	
Banker	238	39.9	9.6	45.5	12.2	
Sales Manager	228	39.7	8.7	42.2	13.0	Sales-Skilled Trades
Printer	269	39.5	10.2	35.5	10.8	
Purchasing Agent	217	38.8	9.3	39.8	11.8	
Funeral Director	354	37.4	9.3	44.7	13.0	
Carpenter	179	36.5	10.3	43.2	12.3	
Real Estate Salesmen	241	35.8	9.9	40.1	12.1	

The mean scores for the occupations presented in Table 17 reflect, for the most part, the same pattern as the correlations presented in Table 16 but there are some differences. While the scientific occupations scored high, and the sales occupations scored low, the social service occupations scored higher, and the creative occupations lower than would be predicted from the correlation coefficients. On the other end of the dimension, the skilled trades and outdoor occupations moved toward the lower end of the scale. (Scores were not available for some of the occupations.)

We have no explanation for the differences in ranking between the correlations and the mean scores, but it should be emphasized that the mean scores are far more stable than the correlation coefficients and would be more likely to replicate in other studies.

The descriptive titles on the right hand side of Table 17 are an attempt to group the occupations in some coherent manner. The scientific groups are in the high end of the table and the sales groups in the low end. The descriptive titles for the other sub-sets may not be the best but give some idea of how the occupations arrange themselves.

Correlations between the ACH mean, mean age, and mean educational level were computed and the results show that educational level and achievement scores are very closely related (r = .81) while age was not related to achievement (r = .17). If one assumes that educational level attained is a measure of academic achievement, then this is further evidence for the validity of the ACH scale.

Item Content

The items that are included in the ACH scale are listed in Table 18 . Responses weighted plus one favor the high achievers, those weighted minus one favor the low achievers. Extreme caution must be used in discussing the significance of individual items--it is very easy to be misled into over-generalizations. Scanning and interpreting of the items should be done only with the intent of fleshing out the bones of the construct already identified.

In the case of the ACH scale, that seems straightforward. The items favoring high achievers continually refer to scientific activities, those favoring the low achievers emphasize business. There also is a suggestion of general aesthetic interests (Be an Author, Poet, Orchestra Conductor) among the positive weights and a flair for the practical skilled trades (Be a Machinist, Operate machinery, Adjust a carburetor) among the negative weights.

All of this, of course, fits very nicely with what has already been established. The interests related to high scores on the ACH scale are generally intellectual with heavy emphasis on science; those related to low scores include business and mechanical, skilled trades types of activities.

Table 18

Items Scored on Academic Achievement Scale

Items Scored Toward High Achievement (Plus Weights)

No.	Item	Scoring Weights		
		L	I	D
9	Author of Novel	+	0	-
10	Author of Technical Book	+	0	-
23	Chemist	+	0	-
27	College Professor	+	-	-
53	Librarian	+	0	-
66	Orchestra Conductor	+	0	-
67	Pharmacist	+	0	-
69	Physician	+	0	-
71	Poet	+	0	-
82	School Teacher	+	0	-
83	Scientific Research Worker	+	0	-
101	Algebra	+	-	-
103	Arithmetic	+	-	-
107	Calculus	+	-	-
108	Chemistry	+	-	-
112	English Composition	+	0	-
115	Geometry	+	-	-
118	Languages, Modern	+	0	-
120	Mathematics	+	-	-
127	Physical Training (I wt only)	0	+	0
128	Physics	+	-	-
130	Physiology	+	0	-
136	Zoology	+	0	-
142	Taking long walks	+	0	-
167	Svmphony Concerts	+	0	-
172	Poetry	+	0	-
192	Giving "First Aid" Assistance	+	0	-
199	Making a Speech	+	0	-
203	Teach Adults	+	0	-
212	Doing Research Work	+	-	-
240	Optimists	+	0	-
243	People who assume Leadership	+	0	-
289	Teach others the use of the machine	+	0	-
295	Opportunity to make use of all one's knowledge and experience	+	0	-
296	Technical responsibility versus supervisory responsibility	+	0	-
353	Reading a book versus going to movies	+	0	-
378	Can write a concise, well-organized report	+	-	-
380	Plan my work in detail	+	0	-

Items Scored Toward Low Achievement (Minus Weights)

2	Advertiser	-	0	+
11	Auto Salesman	-	0	+
13	Auto Repairman	-	0	+
17	Building Contractor	-	0	+
18	Buyer of Merchandize	-	0	+
35	Factory Manager	-	0	+
56	Machinist	-	0	+
81	Sales Manager	-	0	+
90	Specialty Salesman	-	0	+
139	Hunting	-	+	+
143	Boxing	-	0	+
180	"Popular Mechanics"	-	0	+
187	Adjusting a carburetor	-	0	+
190	Operating machinery	-	0	+
231	Climbing along edge of precipice (I wt only)	0	-	0
317	Chairman, Entertainment Committee	-	0	+
345	Physical activity versus mental activity	-	0	+

Summary

The chapter has reported attempts to understand what type of interest pattern, if any, is associated with academic performance in a Liberal Arts College. A scale was developed for the Strong Vocational Interest Blank by comparing the SVIB responses of students with good and poor records. The scale, called Academic Achievement (ACH), has the following characteristics:

1. It is moderately valid in predicting grades, $r = .36$ in cross-validation samples.
2. It adds very little to multiple correlations using high school rank and an ability test score to predict college grades.
3. It is reliable over time within adult populations, test-retest correlations of .88 over thirty days and .66 over 22 years. It is less reliable within college age populations, showing a test-retest correlation of .59 over eight years for a group initially tested as high school seniors.
4. Scores on the scale increase through the young adult years and asymtote about age 28-30.
5. The scale is highly correlated with interests in science and highly negatively correlated with interests in sales.
6. As a group, men in scientific occupations score high on this scale, those in sales and skilled trades score low. Men in social service occupations score moderately high; those in outdoor, rough and ready masculine occupations score moderately low.

Chapter 4

THE USE OF THE ACADEMIC ACHIEVEMENT SCALE

One implicit goal of this research on college students of twenty-five years ago is to find better educational methods. The development of the Academic Achievement Scale discussed in the preceding chapter is an example of one way of developing new tools to use with current students, but a great deal of thought must be given to how these tools are to be used. In this chapter, I want to make very clear my opinions on the use of scales such as the Academic Achievement Scale.

Specifically, I want to voice my very firm conviction that this scale should not be used in the selection of students unless the faculty of the institution is very clear as to what this means.

It is one thing to select students because they are capable (as measured by an ability test) or because they have performed well in the past (as measured by high school rank); it is quite another to select them on the basis of their attitudes or interests (as measured by the ACH scale). The latter approach is not necessarily wrong, but it is different and requires further discussion among those responsible for the institution's educational policy.

To this point, I have acted as if the criterion of grades is a perfectly suitable one and have probably implied that anything we could do to identify those who would be good students (presumably then to use that "anything" in our selection procedures) is good.

That, of course, is nonsense; if we wanted only to select good students, we would simply select all girls--they clearly get better grades than boys.

The situation with the ACH scale is analogous. Selecting only those with high scores might give us slightly better students but is that what we want? I could make a better argument that we should admit only students who score low on the scale. Those who score high already have many of the interests that we try to instill in our students; let's work with those from the low end (assuming they are bright and have achieved in the past) and try to interest them in what we think are the better things in life. To me, that is an especially appealing position for a large state university, responsible to the public good, to adopt. There would be some dissension among my colleagues.

If any interest inventory scale related to grades is not to be used for selection, what then is its function?

First, to serve as a research tool to better understand the educational process.

Second, as an aid to counselors who need the best possible data about their clients. Counselors have little enough information about why some students succeed and others don't; anything that can be put into their hands to help them give more individualized attention to that student sitting across the desk from them can be valuable. The ACH scale may prove beneficial in that setting, and that is why we were so concerned with establishing the construct validity of the scale.

As a final fillip to the argument against the use of the scale in selection, there will be no attempt to keep this scale secret or secure.

Chapter 5

GOOD AND POOR STUDENTS 25 YEARS LATER

Co-authored with Charles Johansson

Grading practices periodically come under attack by members of the academic community. Students sweat under pressure to achieve standards that seem to them artificial; professors fret over their own arbitrariness and agonize over whether to give grades for achievement alone or also for outstanding efforts, good intentions and the like; parents give money, cars, and vacations as rewards on the basis of grades and everybody wonders if it isn't all a game with little relation to the real world.

Of course it is not. Performance in school, for all its vagaries, is probably a better prediction of post-graduation success than anything else we have. Numerous specific studies have shown this. Research, for example, within the Bell Telephone System has shown rank in college class to be substantially related to progress within the company. Very frequently, at least one insurance company has offered a twenty-five percent reduction in rates to students with high grades and though I haven't seen any published data--you can be sure that that decision was based on substantiated data. In the preceding report on the participants in this study, college grades were correlated about .25-.30 with adult achievement.

What follows in this chapter also supports the general conclusion that achievement in college is related to adult achievement. The approach here has been to separate out those students with excellent high school and college grades, specifically the top ten percent, and compare them with the bottom ten percent on a variety of measures. The results indicate that good students continue to achieve more as adults in a variety of ways.

The Sample

From among those subjects in the 25 year followup for whom all information was available, two groups were separated out: the top and bottom ten percent on academic achievement. The criteria for this division were high school rank (HSR) and college grade point average (GPA) while at the University of Minnesota; those who had a HSR percentile of 92 or above and GPA of 3.00 or above were in the top category, those with a HSR of 59 or lower and a GPA of 1.65 or lower were placed in the bottom group. The GPAs were based on all undergraduate work completed at Minnesota and ranged from one quarter's grades to four years.

Selecting a sample in that manner results in the following sex split:

	Top 10%	Bottom 10%	
Males	24	33	
Females	37	28	$\chi^2 = 2.67$, n.s.

Although the chi-square based on that 2 x 2 table was not statistically significant, it would be foolish to conclude that sex is not related to academic achievement for perhaps the best established fact in this whole area is that girls get better grades than boys. For this reason, all of the following results have been analyzed separately for each sex.

Table 8 reports the results of selecting samples in the above manner. Means and Standard Deviations for both HSR and GPA are reported for the top and bottom ten percent, and for the total group. They are also reported for a random sample of students drawn from the same years as the followup sample. The comparison between the followup sample and the random sample indicates that the former was a slightly better group, and suggests that our selection of the upper and lower ten percent is slightly misleading; perhaps we are dealing with the upper eight percent and lower twelve percent but such a difference is of little consequence. The comparisons between the two extremes will still be meaningful.

Table 19

Scores on Academic Achievement Variables

For Top and Bottom 10 Percent, and Total Group

	HSR						GPA*					
	Males			Females			Males			Females		
	N	M	S.D.	N	M	S.D.	N	M	S.D.	N	M	S.D.
25 Yr. Sample	397	68	24.1	369	79	19.7	397	2.1	0.7	370	2.2	0.7
Random Sample	352	62	25.0	361	74	22.4			Not Available			
Top 10 Percent	24	97	2.1	37	97	2.1	24	3.4	0.3	37	3.5	0.3
Bottom 10 Percent	32	38	12.9	29	42	15.1	32	1.0	0.4	29	1.2	0.4

* A = 4.0

Differences in Ability and Achievement

The Minnesota Scholastic Aptitude Test (MSAT)

From data presented in earlier chapters, it is quite evident that there will be differences between the groups on a scholastic ability test. Mean scores on the MSAT, taken by these subjects as adults, are reported in Table 20 for both of the subgroups and the total sample. The subgroups differ by more than two standard deviations, or roughly the equivalent of 30 IQ points--clearly a substantial difference.

Table 20

MSAT Raw Scores for Top and Bottom 10 Percent and Total Group*

	Males			Females		
	N	M	S.D.	N	M	S.D.
Original Sample	318	57	11.6	316	55	12.1
Top 10 Percent	24	65	8.5	37	66	7.9
Bottom 10 Percent	32	48	9.9	29	41	11.9

* Total Possible = 78

Degrees Earned

It is a foregone conclusion that these groups will differ on degrees earned while in college and perhaps the only surprise in Table 21, presenting the degree data, is that ten percent of the poorer students did earn a four year degree, usuallv from some other institution than Minnesota.

Table 21

Highest Degree Level

Highest Degree	Top 10 Percent						Bottom 10 Percent					
	Male		Female		Total		Male		Female		Total	
Level	N	%	N	%	N	%	N	%	N	%	N	%
None	0	0	1	3	1	2	28	85	27	96	55	90
B.A.	9	38	28	76	37	60	5	15	1	4	6	10
M.A.	5	21	3	8	8	13	0	0	0	0	0	0
L.L.B.	2	8	0	0	2	3	0	0	0	0	0	0
M.D.	4	17	1	3	5	8	0	0	0	0	0	0
Ph.D.	4	17	4	11	8	13	0	0	0	0	0	0
	24		37		61		33		28		61	

It should be pointed out that almost two-thirds of the men in the top ten percent and one-fourth of the women went on to earn some advanced degree.

Family Income

The differences in income between the two groups are reported in Table 22. The income is that reported for the family, including any income of the spouse. Thus, for the women, family income usually means the husband's salary. For single women, income represented the women's salary.

For the men, differences in favor of the top students were large and consistent; for the women, smaller and inconsistent. Among the women, the income figures are confounded by differential rates of marriage, (86 percent of the top group are married and 78 of the bottom). For male students, the expectation of a $10,000 increment in salary should be a fair incentive.

Table 22

Total Family Income

	Males			Females		
	Top	Bottom	Difference	Top	Bottom	Difference
Q1	$ 15,230	$ 8,840	$ 6,390	$ 8,500	$ 8,000	$ 500
Q2	22,000	12,000	10,000	12,450	13,750	-1,300
Q3	27,450	19,330	8,120	19,330	16,100	3,230

Total Contribution to Society

In the preceding study on the effectiveness of counseling, an attempt was made to rate each individual on his overall contribution to society. This rating was based on all of the information that was available on each person. Three psychologists, working independently, scanned each person's file folder and, using such information as occupation, community activities, awards won, income, and educational level, assigned a rank from 1 to 5 for each person. These ranks were then added together and constituted the individual's rating on the "Contribution to Society" scale. More detailed information on procedure and results can be found in the earlier report. (Campbell, 1964)

The comparisons between the good and poor students on this rating are presented in Table 23 .

Table 23

Contribution to Society Rating for Top and Bottom Group

Males						Females					
Top 10 Percent			Bottom 10 Percent			Top 10 Percent			Bottom 10 Percent		
N	M	S.D.	N	M	S.D.	N	M	S.D.	N	M	S.D.
24	11.9	1.9	33	9.3	2.1	37	11.6	2.0	28	9.2	2.0
$p < .001$						$p < .001$					

Within both sexes, the difference was approximately one standard deviation, indicating a large and substantial difference. The results on this overall rating, probably the best single measure of success used in this study, indicated very clearly that the good students ultimately do much better--in ways that are important to our society--than do the poor students.

General Adjustment and Satisfaction

Several measures of general adjustment and satisfaction were available on these former students, almost all of them using the individual's self-report. Only a few mild differences were found, all of them showing the better students to be slightly more comfortable with life.

Happiness with Home Situation

We first asked the question, "When you were growing up, how would you describe your feelings toward your family and home situation?" The replies to that question are tabulated in Table 24.

There was a mild, very mild, tendency for the top group to remember their family life more favorably than the bottom group.

Table 24

"When you were growing up, how would you describe your feelings toward your family and home situation?"

	Top Males	Bottom Males	Top Females	Bottom Females	Total Top	Total Low
Very Happy	17 %	21 %	24 %	18 %	21%	20%
Happier than average	46	12	35	40	39	25
About Average	37	58	24	25	30	43
Unhappier than Average	0	9	16	14	10	11
Very Unhappy	0	0	0	4	0	2
	$\chi^2 = 9.50$ $p < .05$		$\chi^2 = 1.75$ n.s.		$\chi^2 = 4.65$ n.s.	

Job and Occupational Satisfaction

We asked each of these individuals to fill in the Hoppock Job Satisfaction Blank and also a modification of this Blank which asked the individual to forget about his specific job and rate his satisfaction with his general occupation. The intent of the latter approach was to get away from the specific job and concentrate on the larger aspect of the individual's career. Results for both scales are reported in Table 25 . Clearly there were no differences between the groups.

Table 25

Job and Occupation Satisfaction*

	Males				Females			
	Top 10 Percent (N = 23)		Bottom 10 Percent (N = 33)		Top 10 Percent (N = 24)		Bottom 10 Percent (N = 17)	
	M	S.D.	M	S.D.	M	S.D.	M	S.D.
Job Satisfaction	30	5.8	31	7.3	27	7.3	27	7.0
Occupational Satisfaction	32	6.3	32	7.0	27	8.4	27	8.3
Total Satisfaction	62	11.5	62	13.3	54	14.6	54	15.0

* Included results of current job, or if unemployed, past job

Marital Happiness

In the interview, the interviewer asked the following question:

> "Taking all things together, how would you describe your marriage; as very satisfying, about average, or not as satisfying as it should have been?"

Though the question allowed only three categories, the interviewers were asked to rate the answers on a five point scale. The points and the percentage falling at each of them are listed in Table 26.

Table 26

Satisfaction with Marriage

"Taking all things together, how would you describe your marriage; as very satisfying, about average, or not as satisfying as it should have been?"

	Top Males	Bottom Males	Top Females	Bottom Females	Total Top	Total Bottom
Very satisfying	74%	67%	77%	64%	76%	66%
Fairly satisfying	17	3	6	4	11	3
Average	9	21	16	12	13	17
Fairly dissatisfied	0	3	0	0	0	2
Very dissatisfied	0	6	0	20	0	12
		$\chi^2 = 6.65$ n.s.		$\chi^2 = 6.87$ n.s.		$\chi^2 = 10.51$ $p < .05$

In both sexes, there was a trend in favor of the top group. When the males and females were combined into a total sample, the sample size increased to the point that the differences became statistically significant. This trend was replicated to some extent by an overall rating of marital happiness made by the interviewer after the entire interview was over. Unlike the first rating, this latter rating was based on further questions asked of the subject, including some on their children's adjustment, plans for the future, and so forth.

The results of that ratings are reported in Table 27.

Table 27

Marital Adjustment

	Top Males	Bottom Males	Top Females	Bottom Females	Total	
					Top	Bottom
Happy	35%	41%	48%	46%	43%	43%
Pleased	35	28	32	21	33	25
Satisfied	26	13	16	12	20	12
Resigned	0	9	3	4	2	7
Unhappy	4	9	0	17	2	13
	$\chi^2 = 4.29$		$\chi^2 = 6.00$		$\chi^2 = 7.67$	
	n.s.		n.s.		n.s.	

While the differences between the groups did not achieve significance in this rating, they were clearly in the same direction. The conclusion seems clear that the better students, on the average, reported more satisfaction with their marriages.

Overall Adjustment

We also asked the interviewer to rate each subject, after the interview, on a general adjustment scale, using all impressions gained during the hour interview. Those results, presented in Table 28, again show a mild trend in favor of the students with the better grades. The trend again was small, but the differences were consistent and among the females were anchored in statistical significance.

Table 28

General Adjustment

	Top Males	Bottom Males	Top Females	Bottom Females	Total	
					Top	Bottom
Happy	25%	24%	39%	25%	33%	25%
Pleased	42	33	22	32	30	33
Satisfied	21	30	33	14	28	23
Resigned	12	6	3	25	7	15
Unhappy	0	6	3	4	2	5
	$\chi^2 = 2.85$		$\chi^2 = 10.05$		$\chi^2 = 4.03$	
	n.s.		$p < .05$		n.s.	

In another attempt to measure overall adjustment and satisfaction, each person was asked this question:

> "Visualize a ladder with ten rungs, the top rung #10 represents the best possible life. The bottom rung, #1 represents the worst possible life. On what rung are you now? On what rung were you when you left college? On what rung will you be in five years?"

The answers for both groups are reported in Table 29. The only difference that appeared between the groups was their report of satisfaction just after they left the University when almost a full standard deviation separated the groups. As adults, however, the two groups did not differ on their own rating of the pleasantness of their lives.

Earlier analysis of these "Ladder" data indicated that the graduates in the total sample rated themselves on a higher rung, just after leaving the University, than did the non-graduates. That possibly is the explanation for the difference found in Table 29.

Table 29

Ladder of Life

	Top Males		Bottom Males		Top Females		Bottom Females	
	M	S.D.	M	S.D.	M	S.D.	M	S.D.
Ladder when left University	6.5	2.0	3.5	2.0*	6.6	2.3	4.8	2.5*
Ladder now	7.5	1.2	7.2	1.2	7.6	1.2	7.5	1.7
Ladder in 5 Years	8.2	1.2	8.3	1.1	8.1	1.0	8.3	1.9

* $p < .01$

Attitudes and Interests

Vocational Interests

In an earlier chapter, differences in vocational interests between top and bottom achieving students were reported at some length.

In general, the results showed that the high achieving students were oriented toward science and social service activities, the bottom achievers toward business activities, particularly sales activities.

Other Attitudes

Further evidence of the differences between these two groups in their outlooks was available in a set of four rating scales that were presented to each individual. The scales, which are outlined in Table 30 concerned Modern Art, Political Beliefs, Conventionality, and Religion. Each person was asked to rate himself on a five point scale on those topics. The comparisons between the Top and Bottom groups are reported in Table 30. The numbers indicate how many individuals in each group located themselves at that point on the scale.

Table 30

Attitudes of Good and Poor Students

		Very	Fairly	Neither	Fairly	Very	
Unfavorable toward modern art	Top	5	17	19	14	6	Favorable toward modern art*
	Bottom	13	17	17	10	4	
Politically liberal	Top	9	23	6	21	2	Politically conservative**
	Bottom	1	19	7	22	11	
Conventional in opinions & values	Top	4	22	13	21	1	Unconvention in opinions & values#
	Bottom	9	38	7	7	0	
Religious	Top	7	32	13	5	4	Non-Religious+
	Bottom	12	37	7	5	0	

* $X^2 = 4.73$ n.s.
** $X^2 = 13.11$ $p < .02$
# $X^2 = 15.99$ $p < .01$
+ $X^2 = 4.78$ n.s.

Significant differences appeared on two of the four dimensions, indicating the better students considered themselves more politically liberal and less conventional in their opinions and values. These outcomes seem consistent with the differences found in the vocational interest areas.

Occupations of the Top and Bottom Groups

One final bit of information is reported here about these two groups of people, their occupations. In Table 31 are listed the job titles as reported by each subject. One should be very cautious in drawing any generalizations from these titles as they can be misleading. For example, one of the high achieving women listed her occupation as "Clerk". That title includes a wide range of possibilities--in that particular case, the woman was a clerk in a University accounting office, responsible for dealing with the budgets of government financed research (including, ironically enough, this project). Other titles in Table 31 are probably equally misleading and the information will simply be presented without comment.

Table 31

Occupations of the Top and Bottom Groups

TOP

MEN	WOMEN
College Professor (4)	Homemaker (7)
Physician (4)	High School Teacher (3)
Foreign Service Officer (2)	College Professor (2)
Small Hotel Owner	Secretary (2)
Corporation President	Medical Technician (2)
Assistant Treasurer-Industrial Firm	Clerk (2)
Bank Vice President	Medical Research Chemist
Public Relations Consultant	Advertising Writer
Bank Comptroller	Assistant Employment Manager
Merchandise Manager	Social Worker
Manager-Large Scientific Research Lab.	Office Chief, Civil Service Office
Production Superintendent	Hospital Public Relations Director
Assistant Manager-Race Track	Psychometrist
Space Scientist	Retail Store Owner
Lawyer	Choir Director
Finance Manager, Large Company	Clerical Supervisor
Public Official	Psychologist

Table 31 (Cont'd)

TOP (Cont'd)

MEN	WOMEN
	Executive Secretary, Scientific Organiz.
	State Department Research Analyst
	Assistant Buyer, Large Department Store
	Bookkeeper for Husband's Firm
	Public Opinion Interviewer
	Librarian
BOTTOM	
Salesman (3)	Homemaker (8)
Corporation President (2)	Secretary (3)
Retail Store Owner (2)	Clerk-Typist (2)
City Employee (2)	Technical Editor
Office Manager (2)	Clerk
U.S. Civil Service	Travel Agent
Corporation Traffic Manager	Telephone Operator
Life Insurance Office Manager	Saleslady
Tax Service Accountant	Training Assistant, Life Insurance Co.
General Manager-Lumber Company	"Classified Job"
Private Detective	Bookkeeper
Assistant Sales Director, Large Firm	Service Representative, Bell Telephone
Pharmacist	Market Researcher
Owner, Advertising Firm	Production Control Manager, Small Firm
Purchasing Agent	Cashier
Corporation Vice President	Advertising Work
Small Building Contractor	Medical Technician
Post Office Clerk	
Minister	
Military Chaplain	
District Manager	
Non-Commissioned Officer-USAF	
U.S. Employment Service Interviewer	

SUMMARY

From the sample of 768 individuals studied in the followup of counseling effectiveness, the students falling in the top and bottom ten percent in academic achievement were separated out for further analysis.

Comparisons between the two groups indicated:

1. As adults there were almost two standard deviations difference between the top and bottom groups. on a scholastic ability test.
2. Almost everyone of the top students graduated from college (98%) while only a few of the bottom group did (10%). Among the top group, two-thirds of the men and one-fourth of the women went on to earn advanced degrees.

3. On measures of marital happiness and general adjustment, there was a very mild trend for the top students to be the more satisfied.

4. Differences between the two groups on vocational interest measures and several attitude rating scales showed that the top group reported more interest in science and service to others, the bottom group more often had business interests. The top group also reports themselves more unconventional and politically liberal.

5. On measures of adult achievement, the top group scored substantially above the bottom group. Among the males, there was a $10,000 difference in median income ($22,000 to $12,000) and for both sexes there were substantial differences between the groups on a global rating of Contribution to Society favoring the better students.

INTRODUCTION TO CHAPTERS 6 AND 7

In all of the research conducted on this sample, nothing very exciting has appeared in the area dealing with their satisfactions except that, for the most part, they were comfortable with life. In the earlier report on the differences between counseled and non-counseled individuals, only a mild trend was noticed, showing the counseled ones to be slightly less satisfied.

In the preceding pages of this report, few sizeable differences were found between any of the designated groups on the satisfaction variables.

In the next two chapters, attempts have been made to understand what is involved in general satisfaction with life. The first deals with men who claimed to have different interests from their co-workers, the second with college-educated mothers who chose to seek employment outside of the home while their children were still young. In these two chapters, some patterns of dissatisfaction--patterns which seemed intuitively reasonable--did appear. In brief, they indicated that men who claim to have different interests from their colleagues derive less satisfaction from their jobs and more from extra-vocational activities than do their colleagues. Concerning the employed mothers, as a group they seemed more dissatisfied with their situations than their non-employed counterparts.

Chapter 6

EXPRESSED INTERESTS AND WORKER SATISFACTION

Co-authored with Robert P. Thorpe

The extensive research in worker satisfaction has identified many job factors which, singly or in combination, help determine the worker's satisfaction or lack of it. Many studies have pointed out the importance of security, pay, good supervision, chance for advancement, and working conditions to the worker. Herzberg _et_. _al_. (1957), however, in a review of the literature on job attitudes report that interest in the intrinsic nature of the job was the factor most frequently mentioned as influencing job satisfaction for workers (pp. 43-47). Troxell (1954) and Reynolds and Shister (1948) are two other studies which indicate that having interesting work ranks high among the wants of workers. Since, with other things being equal, a person will probably be more satisfied in a job that is interesting to him, it would be of some value to know what makes a job interesting and satisfying to the worker.

Several studies have attempted to show the relationship of satisfaction to the worker's pattern of vocational interests. Sarbin and Anderson (1942), Herzberg and Russel (1953), and Kloster (1956) have all presented conclusions supporting the hypothesis that satisfaction would be higher for workers in occupations that matched or were suitable to their interest patterns. These latter studies have indicated the important relationship to job satisfaction of _inventoried_ _interests_.

According to Super (1962) inventoried interests are measured by weighting an individual's responses to preference for certain activities and occupations in such a way as to give a pattern of scores for comparison with people in a variety of occupations. This gives an objective estimate of a person's interests (p. 380). The two best known methods of obtaining a profile of inventoried interests are with the Strong Vocational Interest Blank and the Kuder Preference Record.

Expressed interest, on the other hand, is the verbal acknowledgement of interest in an object, activity, task, or occupation. The subject simply states he likes or dislikes something (Super, 1962). In contrast to inventoried interests, the individual is aware of his expressed interests and, in particular, he is aware of how his pattern of interests as he perceives them compares with the expressed interests of his coworkers. It is possible that the comparisons of expressed interests would be a more powerful source of dissatisfaction than inventoried interests since the worker would have a stronger feeling of "not fitting in" if his interests were unlike those of his coworkers.

Method

This chapter will attempt to show that expressed interests might profitably be used in the study of worker satisfaction. Two groups of men were selected on the basis of whether they felt their interests were like or unlike the interests of other people in their occupations. Specifically, the subjects were the male participants from the earlier study of counseling effectiveness.

These men were divided into two groups on the basis of their response to an interview question: "Generally speaking, are your interests typical of others in your field?". Of those responding, 212 said "Yes", (their interests were like others in their field) while 102 men responded "No" (their interests were different). In the discussion and tables that follow, those men who responded "Yes" will be referred to as the LIKE group, those who responded "No" will be called the UNLIKE group.

These men were all in their early or mid-40's; there were no differences in the average number of years each group had spent on their current jobs or in their current occupation. The groups also showed no difference in the average number of jobs held since leaving school.

The men represented a great variety of jobs and occupations in all parts of the country. Since no two men were working in the same job environment, any sources of dissatisfaction specific to a particular job should be canceled out and any differences in satisfaction that did appear should be due to the suitability of each man's interest pattern to the job he held.

Results and Discussion

A number of questions adapted from the Hoppock Job Satisfaction Blank were included in the questionnaire and the subject's responses to these questions were weighted to give a numerical index of total work satisfaction. The results in Table 32show that the LIKE group had a significantly higher average satisfaction score than the UNLIKE group.

Table 32

Occupational Satisfaction Scores of the LIKE and UNLIKE groups

	LIKE	UNLIKE
Mean	62.9	57.6*
S.D.	13.2	12.0
N =	199	86

* Significant $p < .001$

As a further measure of work satisfaction, the two groups were compared on their responses to two interview questions. One question asked, "Would you like your son to follow in your occupation?" while the other asked, "Is there some other kind of work you'd rather be doing?" We might predict that if a man were in a job situation he did not like, he would be less likely to wish that same type of job onto his son. In the same way, a man who liked his job would probably be less inclined to think about being in some different line of work. The responses to these two questions are presented in Tables 33 and 34.

Table 33

Distribution of Responses to the Question

"Would you like your son to follow in your occupation?"

	LIKE	UNLIKE
Yes	44.2 %	36.4 %
No	39.4	51.5
Don't Know	16.4	12.1
N =	208	99

X^2 Significant $p < .1$

Table 34

Distribution of Responses to the Question

"Is there some other kind of work you'd rather be doing?"

	LIKE	UNLIKE
Yes	27.1 %	50.0 %
No	72.9	50.0
N =	207	102

X^2 Significant $p < .001$

These figures show that the LIKE group were more willing to have their sons follow in their occupation and less anxious to consider some other kind of work. All of the above data indicated that the UNLIKE group was relatively less satisfied with their work situation than the LIKE group.

How had this difference in work satisfaction affected the two groups in their levels of general satisfaction? The importance of work in a man's life is obvious; through it he obtains not only the means to survive but also most of the material ingredients for a happy existence. It is not clear, however, exactly how an individual's life may be affected by his satisfaction with the particular job he holds. Woods (1944) and Weitz (1952) have suggested that an inter-relationship does exist between job and general satisfaction, with job satisfaction possibly exerting a greater influence on general satisfaction than the reverse (see also Brayfield, Wells, and Strate, 1957). We might expect, therefore, the UNLIKE group, who were less satisfied with their job than the LIKE group, to be less satisfied with life in general.

To test this possibility, the following question was used as a crude measure of satisfaction with life:

> "Imagine a ladder with 10 rungs. The top rung, No. 10, represents the ideal life and the bottom rung, No. 1, represents the worst possible life. On what rung do you think you are now?"

The responses to this question as shown in Table 35 indicated no difference between the two groups in level of general satisfaction.

Table 35

General Life Satisfaction Scores

"Ladder of Life"

	LIKE	UNLIKE
Mean	7.26	7.22
S.D.	1.41	1.16
N =	206	98

The two groups differed significantly in work satisfaction but not at all in general satisfaction. Why didn't the dissatisfaction with their work of the UNLIKE group have any detrimental effect on their general satisfaction? A possible answer might be that this UNLIKE group somehow compensated for their lack of satisfaction in their occupation by taking part in hobbies or other activities which gave them the necessary fulfilling experiences to keep life satisfying.

Two of the questions which were asked in the interview may help support this idea. The participants were asked, "Which of your accomplishments are you most proud of?" The frequency of responses to this question are presented in Table 36.

Table 36

Distribution of Responses to the Question:

"Of which of your accomplishments are you most proud?"

	LIKE	UNLIKE
Occupation	44.7 %	37.4 %
Family-Marriage	34.5	32.1
Avocation	3.5	11.5*
Education	6.3	4.6
Friends	1.4	1.5
Other	9.6	12.9
N =	284	131**

* Significant $p < .001$
** More than one response could be given

The two groups did not differ greatly in their responses, but the LIKE group seemed slightly more proud of their jobs while avocations were mentioned more often by the UNLIKE group.

The second question, in a slightly different vein, was "What aspects of your life give you the most satisfaction?" Table 37 gives the responses to this question.

Table 37

Distribution of Responses to the Question:

"What aspects of your life give you the most satisfaction?"

	LIKE	UNLIKE
Occupation	34.2 %	25.2 %
Family-Marriage	36.6	30.8
Avocation	8.2	13.8*
Financial Security	4.7	5.0
Friends	7.3	10.7
Other	9.0	14.5
N =	342	159**

* Significant $p < .05$
** More than one response could be given

As before the differences were not great, but they were in the predicted direction. Apparently, the job meant more to the LIKE group than to the UNLIKE group which in turn favored their avocation more than the LIKE group. The UNLIKE group, as a whole, appeared to gain less satisfaction from their jobs and, curiously, also from their families, and more satisfaction from their avocations, friends and other activities.

It does seem that some sort of balancing process was in operation in the UNLIKE group. These men were in occupations where they felt their interests were not similar to the interests of the typical members of the occupation; their job was a source of dissatisfaction but they apparently had been able to find some compensating satisfaction in their off-the-job activities.

Perhaps their avocations were more in line with their inventoried interests.

It may be possible to relate this assumption about avocations and interests to an early study by Super (1941) in which he investigated the relationship of avocations to vocational adjustment. Super's findings seemed to indicate that an individual has certain dominant interests which are manifested in either, or both, his vocation and avocation. The vocationally adjusted person may have an avocation similar to his vocation and be able to gain satisfaction from both. On the other hand, the person who is in a vocation that does not provide an outlet for his dominant interests will find an expression or outlet through his avocation which will likely provide a greater degree of satisfaction than his vocation. From Super's conclusions we can probably say that in this study the LIKE group found an outlet for their interests in their job, while the UNLIKE group found an outlet in their avocations and other off-the-job activities. Both groups were thus able to find, in their own ways, the means toward a satisfying life.

The findings reported above indicate that a measure of expressed interests can differentiate between workers with different degrees of job satisfaction. As mentioned earlier, other studies have presented similar results utilizing measures of inventoried interests such as the Strong Vocational Interest Blank. It would be interesting then to see what relationship might exist between expressed and inventoried interests. As part of the counseling follow-up study, each participant was asked to complete the Strong Vocational Interest Blank (SVIB). A group of experienced vocational counselors from the Student Counseling Bureau at the University of Minnesota was then asked to compare each person's interest profile with the occupation he was in. These counselors rated the congruence between interests and occupation on a six point scale. A rating of 6 indicated a good match between a person's interests and his occupation, while a rating of 1 meant a poor match--the person was in an occupation not suited to his interests.

These congruency ratings were then correlated with a number of variables, including the responses to the original criterion question: "Are your interests typical of others in your field?" The results are presented in Table 38.

Table 38

Comparison of Correlations of the
SVIB Congruency Ratings and Interview Question
With Satisfaction Variables

	Occupation Satisfaction Scores	Life Satisfaction Scores	Criterion Question
SVIB Ratings	r = .21*	r = .03	r = .10
Criterion Question	r = .25*	r = .01	

* Significant $p < .001$

It can be seen that, although low, both the SVIB ratings and the interview question correlated higher with occupational satisfaction than with life satisfaction. It can also be seen that the single interview question correlates about as well as the entire SVIB. This does not mean, however, that simply asking a person what his interests are would be as good a measure as the SVIB. The low correlation between the SVIB ratings and the question indicated that they are measuring different aspects of the person. The Strong Blank, for instance, asks the individual which of several activities he would prefer, regardless of the fact he may never do so in his everyday life. A measure of expressed interests may deal more with activities which the person has in fact chosen or not chosen to take part in.

Another explanation of the relationship of SVIB measured interests to expressed interests might be found in a study by McArthur and Stevens (1955) on the validity of expressed and inventoried interests on career choice and

and adjustment. In that study the authors found that the expressed and inventoried interests of 60 college sophomores were of about equal validity as predictors of later career choice and occupational adjustment or satisfaction. The authors also indicated, however, that as a predictor the SVIB was most applicable to men from a middle class origin and less applicable than expressed interests for men from upper-middle and upper class groups. It is possible that the men in the LIKE and UNLIKE groups might also have differed in their social-class origins. Unfortunately, the background information available on these men did not provide an adequate test of this possibility.

A final point: an area of research which has been neglected is the nature of avocational interests. Outside of Super (1940), little attention has been given to avocational interest patterns. It is possible that with the recent refinements in scoring and analyzing the Strong Blank, psychologists might be able to develop a golfing, bowling, or kite flying key. Such findings could have some practical use if the predicted increase in the time available for leisure evolves; people will want to know which sports or hobbies they would likely find most satisfying. Out of this there may even originate a new professional--the avocational psychologist.

Summary

This chapter has presented a study of the relationship of a measure of expressed interests to job and life satisfaction. The results indicated that a worker who perceives his interests to be different from other people people in his occupation will likely show greater dissatisfaction with his occupation. The level of general satisfaction with life for this worker apparently is not affected since he finds an outlet for his interests in off-the-job activities. Related to these findings, suggestions were offered for future research in areas of worker satisfaction and avocational interests.

Chapter 7

THE EMPLOYMENT OF MOTHERS WHO HAVE BEEN COLLEGE TRAINED

Co-authored with Jack E. Rossmann

One of the interesting events taking place in today's world of work is the increasing influx of married women. Labor department data from the past two and one-half decades leave little doubt as to the ever-expanding number of not only married women but married women with children of pre-school and school age who are entering the labor market. Predictions indicate that by 1970 eighteen to twenty million married women will be employed, about forty percent of the married population.

The fact that married women are seeking employment outside the home in increasing numbers raises many questions. Among these is the question of motivation. Why does the mother of school-age or pre-school children enter (or remain in) the labor force? How does the "working mother" differ from the non-employed members of her age group?

Popular literature today abounds with "answers" or with attempts to answer questions about the role of women in today's society. Some professional journals have even found these problems of enough importance to devote entire issues to their discussion. There is little doubt that the societal role of women, especially their impact on the world of work and its impact upon them, is of increasing concern to both professional people and popular writers.

Some tentative answers have been proposed to the question of motivation for work among married women. Siegel (1962), for example, has suggested that several factors might be involved. One might be pure economic motivation, either to make ends meet or to help improve the family's standard of living. She states that another factor in some instances may simply be a desire to feed personal vanity. But she seems to think that in a much greater number of instances, particularly among college-educated women, much of the motivation is due to a social service drive.

Roe (1962), on the other hand, concludes that additional income is probably the primary motive for most married women to seek outside employment. She points out, however, that even though money may be the prime mover, various other needs are probably also satisfied. Among these are the need for group acceptance, a feeling of contribution, and a desire to completely utilize one's abilities.

In an attempt to summarize much of what is known or hypothesized about motivation for maternal employment, Hoffman (1963) also recognizes the importance of money. Whether it is based on actual financial need, perceived need, or some other basis, she is aware that money is an important factor. She considers also other motivational possibilities; decreased satisfaction from household tasks as a result of technological advances, frustrating aspects of the maternal role, and personality variables such as the needs for achievement, actualization, power and independence.

While these writers might disagree as to the prime reason why married women work outside the home, all would seem to agree that some factor or factors other than financial return is involved. Like most writers interested in this area, however, they find a shortage of empirical data to support their conjectures. This research was designed to contribute evidence on the issues involved.

Conceptual Framework

To provide a conceptual framework, within which to study the decision to work, Sobol (1963) has proposed a "theory of commitment to work" and it is this theoretical approach which provides the framework for this study. Sobol's theory proposes three classifications of factors influencing the wife's decision to work. First are enabling conditions or family status variables. Within this category are such factors as number of children, age of children, future child expectations, and current pregnancy. The second classification is facilitating conditions or factors concerned with the ease with which work can be obtained. Wife's education and prior work experience are variables included here.

The final classification is precipitating conditions. These are considered by Sobol to be measures of relative dissatisfaction. Financial factors such as husband's income and the attitudinal factors of life satisfaction and the need for accomplishment are examples of precipitating conditions.

Methodology

This chapter utilizes Sobol's framework to identify factors which may influence the decision to work outside the home among married women with children at home. The subjects were the 240 women from the counseling followup study who were currently married mothers with children at home.

To analyze the dependent variable, maternal employment, the sample was divided into part-time (N=33), full-time (N=33), and non-employed (N=172) mothers. Since previous research on part-time versus full-time employment has been inconclusive as to whether these two groups represent different kinds of women or differing opportunities for employment, it was decided to divide the employed mothers into these two categories.

Two precautions should be observed in interpreting these findings. The first concerns the restricted population to which the findings may be generalized. The sample was comprised of women who entered the University of Minnesota during the years 1933-36. Approximately fifty percent of these women received vocational counseling as freshmen at the University and the other half did not seek counseling. Thus, generalizations from these findings beyond a group of women, all of whom enrolled in a large university approximately twenty-five years ago and half of whom received vocational counseling, should be made cautiously.

The second precaution deals with analyses employed within the conceptual framework. No statistical analyses was made of the hierarchy of factors related to the decision to work. With the techniques utilized, chi-square and analysis of variance, all that can be concluded is that a particular variable is or is not significantly related to the decision to work and that it logically appears to function as an enabling condition, facilitating condition, or precipitating condition.

Findings

Within the limitations of the sample and analyses utilized, the following relationships were found.

Enabling Conditions

Of the variables tested as enabling conditions, the data, reported in Table 39, indicate that number of children in the family and age of the oldest children bore no significant relationship to the mother's decision to work, either part-time or full-time. Even for this relatively homogeneous sample (college women between the ages of 42 and 47), however, it appeared that the children of mothers currently employed were grouped more closely than were the children of the other two groups of women. The youngest child of mothers employed full-time was significantly older than the youngest child of non-employed mothers with the mean age of the youngest child of part-time employed mothers between the other two groups.

Table 39

Enabling Conditions

Variable	Non-employed Mothers	Part-time Employed Mothers	Full-time Employed Mothers	Level of Significance
Mean number of children	2.9	3.2	2.5	n.s.
Mean age of oldest child	16.2	16.8	17.6	n.s.
Mean age of youngest child	9.6*	10.9	13.0*	.01
N =	165	30	32	

* The means which differ, according to Schefe's test, are underlined.

Facilitating Conditions

College graduation-non-graduation and scholastic aptitude test scores were tested as facilitating conditions, those factors dealing with the relative ease or difficulty with which work can be obtained. Data on those two variables are presented in Table 40 .

Table 40

Facilitating Conditions

Variable	Non-employed Mothers	Part-time Employed Mothers	Full-time Employed Mothers	Level of Significance
Percentage of College Graduates	55.3 (170)*	63.6 (33)	63.6 (33)	n.s.
Mean score on MSAT	54.4 (161)	56.3 (31)	60.4 (29)	.05

* = N

Surprisingly, possession of a college degree did not serve as a facilitating condition among these women, all of whom had some college education. While it would undoubtedly bear some relationship to the kind of work which could be obtained, it was not significantly related to the actual decision to work.

The mean score of mothers employed full-time, on the Minnesota Scholastic Aptitude Test (MSAT) taken twenty-five years after leaving the university, was significantly higher than that for non-employed mothers. The average score of part-time employed mothers fall between that of the other two groups. Thus, it was the brighter women who were most likely to have returned to outside work while raising a family. But the causal relationship was not clear. Were these women in the labor force because their mental ability made more desirable jobs available to them (i.e., aptitude is a "facilitating condition") or did their greater "brainpower" make them more likely to be dissatisfied functioning only within the role of homemaker (i.e., aptitude is a "precipitating condition")? The present data cannot answer this question.

Precipitating Conditions

The two variables found thus far to be significantly related to the decision to work may be functioning as "qualifiers". That is, a woman with some college education whose children are grouped relatively closely and who possesses a great deal of mental ability may be in an advantageous position to consider employment outside the home. The factors which push the women over the "threshold" into the labor market or pull her back into the wife-mother role comprise the syndrome of variables which Sobol calls "precipitating factors".

Five variables were tested as precipitating factors: satisfaction with life, marital satisfaction, relative education of husband and wife, vocational interests, and family income. Data on their relationship to the employment status of the mother are presented in Tables 41, 42, and 43.

An adaptation of Kilpatrick and Cantril's "self-anchoring scale" was used to measure satisfaction with life. (1960) Each subject was asked to picture a ladder with ten rungs. The top rung, number ten, represented the ideal life and the bottom rung, number one, the worst possible life. The subject was asked to place himself somewhere upon this "ladder of life" at three different points in time: when she left the university, at the present time, and five years from now.

Table 41

Precipitating Conditions

Variable	Non-employed Mothers	Part-time Employed Mothers	Full-time Employed Mothers	Level of Significance
Mean satisfaction with life				
1) when leaving college	5.50 (165)*	5.81 (32)	4.83 (29)	n.s.
2) at present time	7.63 (163)	7.12 (33)	6.97 (29)	.10
3) five years from now	8.44**(162)	7.66 (32)	7.68 (28)	.01
Percentage of less than very satisfying marriages	21.7 (166)	30.3 (33)	58.1 (31)	.01
Percentage of wives having more education than their husbands	15.6 (165)	46.7 (30)	43.7 (32)	.01
Median family income	$15,000 (162)	$12,000 (29)	$7,150 (32)	.001

* Number in parentheses equals N

** All underlined means differ from each other at the 5 percent level of confidence or better

No differences were found in Table 41 among the three groups in satisfaction with life at the time they left the university. At the other two points in time, however, employed mothers were less satisfied with their lives. Both the part-time and full-time employed mothers anticipated that they would be less satisfied with their lives in five years as compared to non-employed mothers. On current satisfaction with life, full-time employed mothers were less satisfied than non-employed mothers. General satisfaction with life did indeed seem to be a precipitating condition.

For this study, marital satisfaction was measured with one question. The women were asked: "Taking all things together, how would you describe your marriage: as very satisfying, about average, or not as satisfying as it should have been?" The response was recorded on a five point continuum: very satisfying, fairly satisfying, average, fairly dissatisfying, very dissatisfying. Full-time employed mothers were found to be less satisfied with their marriages than either the non-employed mothers, or the part-time employed mothers. On this variable, the part-time employed mothers more nearly resembled non-employed mothers than full-time employed mothers.

It should be noted that marital dissatisfaction may be consequence as well as antecedent of gainful employment since the measures of marital satisfaction were collected after employment rather than before.

The third variable tested as a precipitating condition dealt with the relative education of the husbands and wives. The data indicated that a significantly greater number of the employed wives, both part-time and full-time, had more education than their husbands. Determination of more education was based on possession of at least one degree (i.e., bachelor's or advanced degree) more than the spouse. This factor of discrepancy in education is not only theoretically linked with dissatisfaction with husband's performance as bread winner but may also be related to expressed marital or life satisfaction among the full-time employed mothers. Research such as that of Terman's (1938) has indicated that when wives have significantly more education than their husbands, they are less happy with their marriages.

On these three variables, life satisfaction, marital happiness, and discrepancy in education, our data do support Sobol's contention of a syndrome of precipitating factors which has some influence on the mother's decision to work.

Vocational Interests

Utilization of the Strong Vocational Interest Blank data was made somewhat difficult because of several factors. First, although seven of the twenty-eight comparisons were significant at the .05 level of confidence, one or possibly two of the F values would likely be significant merely because of chance. While something other than chance was probably operating, it should also be recalled that the Strong occupational scales are not independent. Data from the 1959 Strong manual indicate that the intercorrelations among the lawyer, social science teacher, YWCA secretary triad are quite high. Thus, it is not surprising that if the means differ significantly on one of these scales, the other two will follow suit. Similarly related are the other four scales: stenographer-secretary, business education teacher, artist, and physician. Perhaps, therefore, there actually were basically only two significant F values and it was simply a chance factor that was operating.

A second problem added support to the "chance" hypothesis. It was difficult to find any logical pattern among the seven occupational scales on which the means were significantly different. While, as pointed out above, the scales intercorrelate statistically, it was much harder to find a practical and meaningful relationship among them. Perhaps this is at least partially a reflection of paucity of research on the Women's Strong. Perhaps there really is a meaningful pattern that as yet remains undisclosed.

Table 42

Means, Standard Deviations, and F Values on Occupational Scale Standard Scores of the Strong Vocational Interest Blank for Women for Full-time, Part-time, and Non-employed Mothers

	Full-time N = 31		Part-time N = 30		Non-employed N = 163		
	M	S.D.	M	S.D.	M	S.D.	F
Artist	30.29[a]	9.55	24.77[a]	9.28	29.96	10.16	3.58*
Author	30.45	10.65	25.93	10.45	29.53	11.11	1.59
Librarian	33.39	7.59	28.63	8.70	30.55	8.93	2.30
English Teacher	28.35	14.55	26.40	11.17	26.29	11.96	.37
Social Worker	31.52	13.36	36.00	12.94	33.13	10.88	1.19
Psychologist	30.39	14.07	27.97	12.36	25.34	13.21	2.12
Lawyer	30.32	10.89	32.17[b]	12.73	26.60[b]	10.72	4.06*
Soc. Sci. Teacher	27.77	14.76	31.83[c]	12.22	23.62[c]	12.53	5.79**
YWCA Secretary	19.77	11.02	21.00[a]	8.10	15.92[a]	10.94	3.96*
Life Insur. Sales	25.19	9.27	28.93	13.60	26.30	10.26	1.61
Buyer	21.00	10.13	25.50	12.76	25.15	11.30	1.82
Housewife	36.74	8.39	39.97	8.12	38.91	8.39	1.23
Elem. Teacher	32.26	9.64	35.83	9.15	33.60	10.33	.98
Office Worker	34.19	12.42	38.57	10.78	36.35	11.42	1.09
Stenog.-Secy	31.58[b]	8.45	35.00	10.38	37.00[b]	11.04	3.48*
Bus. Educ. Teacher	26.00[b]	11.53	33.93[b]	10.56	28.60	11.28	4.05*
Home Econ. Teacher	24.03	12.11	29.27	14.04	25.58	13.52	1.27
Dietician	27.84	12.34	31.47	12.56	28.59	10.77	.96
Phys. Ed. Teacher	23.97	11.79	23.43	9.17	20.32	11.82	1.86
Occup. Therapist	30.39	8.24	28.60	10.16	31.16	9.84	.90
Nurse	30.55	12.34	29.60	14.98	27.83	11.36	.81
Math Sci. Teacher	29.97	11.18	30.87	12.58	27.05	11.01	2.00
Dentist	31.64	9.25	27.07	12.34	27.00	10.11	2.58
Lab. Technician	31.00	12.88	25.53	14.53	26.35	11.23	2.16
Physician	30.42[c]	9.07	23.63[c]	12.74	23.33[c]	11.28	5.22**
Music Teacher	23.52	11.75	25.07	12.15	24.58	11.97	.14
Musician Performer	28.45	9.67	25.23	11.06	29.59	10.10	2.32
Femininity-Masculinity	50.97	9.49	54.53	11.03	56.51	10.13	2.75

---

* Significant at .05 level of confidence.

** Significant at .01 level of confidence.

[a] Means indicate those which differ significantly at the .10 level of confidence according to Schefe's test.

[b] Means indicate those which differ significantly at the .05 level of confidence according to Schefe's test.

[c] Means indicate those which differ significantly at the .01 level of confidence according to Schefe's test.

One other problem, and one which makes it seem naive to even have expected that differences would appear on individual occupational scales, is the variety of occupations which the working mothers represent. Approximately half were in business related occupations and the remainder were divided between the medical sciences and teaching. In other words, if the SVIB is a valid instrument, and it has proven itself to be reasonably so, one would expect that the interests of women engaged in particular occupations to be similar to the interests of those women in Strong's criterion groups. Therefore, even though the women currently teaching might score quite high on one or two of the teacher's scales, these scores would be lowered on the average by the women who are engaged in business related activities or the medical sciences. Perhaps, then, significant differences among means simply reflects the total number of women in an employment group who were engaged in a specific occupation or family of occupations.

In spite of these pitfalls, it appears that the Strong data do suggest certain patterns. Examining relationships which were for the most part not statistically significant, it may be noted that on the "pre-marital" scales, housewife, elementary teacher, office worker, and stenographer-secretary, the mean scores of the non-employed mothers were above those of the full-time employed mothers. This would fit the concept of the homemakers vs. career girl.

A second pattern appeared among the physical science scales: nurse, math-science teacher, dentist, laboratory technician, and physician. On all five of these scales the mean standard scores of full-time employed mothers were above those of non-employed mothers.

These patterns were especially interesting when compared with Hoyt and Kennedy's (1958) findings from college freshmen who had been divided into career vs. homemaking groups. With one exception (MATH-SCIENCE TEACHER) the scores were in the same direction. Equally interesting was the finding that on all but four of the twenty-seven occupational scales, the relationship between the means in this study and that of Hoyt and Kennedy's was the same. The exceptions, in addition to MATH-SCIENCE TEACHER were: SOCIAL SCIENCE TEACHER, YWCA SECRETARY, and MUSICIAN PERFORMER. It appears, therefore, that although the magnitude of the differences between the means varies considerably, the measured interests of career-oriented college freshmen may be similar to those of college women who eventually combine raising a family with holding a full-time job.

Family Income

Most studies of the working mother have concluded that husband's income is an important factor in the wife's decision to work. The higher the income, the smaller the probability that the wife will be working. But in the United States population as a whole, the relationship is not perfectly inverse because the largest percent of working mothers is found in families where the husband's median income is just below the nation-wide median. The relationship is curvilinear with both the lowest and highest income categories having fewer working mothers than the middle income group.

This was not true for the women in this study. The median incomes for the husbands of full-time, part-time, and non-employed mothers respectively were $7,150, $12,000, and $15,000. Only seven percent of the non-employed mothers had family incomes below $8,000 whereas twenty percent of the part-time employed mothers and approximately fifty percent of the mothers employed full-time fell into this category.

For this sample, contrary to the national trend, there was an inverse relationship between family income, other than wife's, and the decision to work outside the home. One reason for this might be the small number of working class or low income families represented in the study. The sample was comprised largely of middle and upper income families which may account for the lack of a curvilinear relationship.

Because significant differences were found between employed and non-employed mothers on husband's income, the two hypotheses which might be highly influenced by income--marital satisfaction and life satisfaction--were retested, controlling on median family income. Income was controlled by using data from only those subjects in the part-time and non-employed mothers' groups whose median income was equal to that of the full-time employed mothers' families. This reduced the number of part-time employed mothers to eleven and the number of non-employed mothers to twenty-one.

Table 43

Precipitating Conditions with Income Controlled

Variable	Non-employed Mothers		Part-time Employed Mothers		Full-time Employed Mothers		Level of Significance
Mean satisfaction with life		N		N		N	
1) when leaving college	5.45	(20)	4.50	(10)	4.83	(28)	n.s.
2) at present time	7.75	(20)	6.80	(10)	6.96	(28)	n.s.
3) five years from now	8.55	(20)	5.90	(10)	7.67	(28)	.02
Percentage of less than very satisfying marriage	23.8	(21)	40.0	(10)	60.0	(30)	.02

The most striking aspect of the marital satisfaction reanalysis was the stability of the proportion of non-employed mothers (now drawn from lower income families) who rated their marriages as unsatisfying. When income was not used as a controlling factor, twenty-two percent of the non-employed mothers described their marriage as less than very satisfying; when income was controlled, this figure rose only to twenty-four percent. In both instances, the null hypotheses was rejected by the Chi-square test although the level of confidence dropped slightly.

It appears that level of family income played a more important role in determining the marital satisfaction of part-time employed mothers. The percentage of mothers employed part-time who described their marriage as unsatisfying increased from twenty-seven to forty percent and the chi-square test of independence with full-time employed mothers dropped from significance at the .01 level to non-significance. But the small sample of ten dictates caution in interpretation.

The second series of hypotheses retested with income controlled dealt with the life satisfaction measure. Here the F value for satisfaction with life at the present time became non-significant (it was significant at the .05 level of confidence before the income control was applied), though the perceived satisfaction with life in five years maintained a significant F value.

Further Research

Frequently research which seeks to answer certain questions succeeds equally well in raising other questions. This work has been no exception. While several significant relationships have been found, the nature of the data do not permit a causal interpretation in most instances. Thus, a major contribution to maternal employment would be provided by a longitudinal investigation designed primarily to study employment among women and launched at the time women enter college. From psychometric data collected at the time of enrollment plus intensive follow-up interviews each three to five years thereafter, a more adequate basis for determining cause and effect relationships should be obtained.

Future research might also be concerned with learning more about the differences between part-time and full-time employed mothers. Data from this study showed statistically significant differences between the two groups on marital satisfaction. Was this difference due to a chance factor, or are these two populations unique in certain respects?

Further research testing the value of Sobol's theory would also be valuable. For this research, his formulations have been useful in generating hypotheses and in providing a meaningful framework within which to view the findings.

Summary

The main conclusion from this chapter is that for educated mothers, once the demands of a limited number of enabling and facilitating factors are met (such as family planning and general ability level), there is a syndrome of precipitating factors (such as marital and life satisfaction, amount of education in comparison with husband, husband's income and vocational interest patterns) which operate differentially, in the predicted direction, in the decision to work outside the home.

Chapter 8

LIBERALS AND CONSERVATIVES

Co-authored with Dr. Jack Rossmann

Stereotypes of Liberals and Conservatives abound in popular literature; valid empirical descriptions of the two are more difficult to find. This chapter is an attempt to compare these two political types, using college-educated samples, on the various sociological and psychometric measures used in the earlier chapters.

In general, the approach used here was to ask the participants in the counseling followup study to sort themselves into political categories--then the differences between these categories were studied. Specifically, in the questionnaire, the individuals were asked to locate themselves on a five point scale of political liberalism-conservatism. Later, in the interview, they were asked which political party they usually agreed most with.

Using a combination of these two questions, the samples studied here were identified, i.e., "Liberal Democrats" and "Conservative Republicans". Liberal Republicans, Conservative Democrats, and Independents--three groups totaling about 25 percent of the original group--were excluded. In the remaining group, the Conservative Republicans out-numbered the Liberal Democrats almost two to one. The numbers in each category are indicated in Table 44.

Differences between the two groups on a variety of variables, clustered together into meaningful groupings, are reported below. The first grouping, reported in Table 45, contains demographic information.

Table 44

Designation of Criterion Groups

	Very Conservative	Somewhat Conservative	Neither	Somewhat Liberal	Very Liberal
		Male			
Democrats	1	8	6	57	30
Republicans	36*	98	18	28	1
		Female			
Democrats	2	15	13	50	22
Republicans	30	120	22	28	--

* The boxed numbers indicate the categories included in this study.

Total Male N = 221 Total Liberal N = 159

Total Female N = 222 Total Conservative N = 284

Total N = 443

Table 45

Liberals versus Conservatives on Sociological Variables

Variables (In Percent)	MEN Liberal N = 91	MEN Conservative N = 136	Level of Signif.	WOMEN Liberal N = 72	WOMEN Conservative N = 150	Level of Signif.	TOTAL Liberal N = 163	TOTAL Conservative N = 286	Signif.
RELIGIOUS PREFERENCE									
Protestant	26.4	72.1	.001	36.1	75.3	.001	30.7	73.8	.001
Jewish	33.0	5.1	.001	26.4	1.3	.001	30.1	3.1	.001
Catholic	13.2	9.6	n.s.	11.1	12.0	n.s.	12.3	10.8	n.s.
None	17.6	9.6	n.s.	16.7	4.7	.01	17.1	7.0	.01
Other	9.8	3.6	n.s.	9.7	6.7	n.s.	9.8	5.3	n.s.
	100.0	100.0		100.0	100.0		100.0	100.0	
MARITAL STATUS									
Married and living with original spouse	74.7	91.9	.001	70.8	77.3	n.s.	73.0	84.2	.01
Other	25.3	8.1		29.2	22.7		27.0	15.8	
	100.0	100.0		100.0	100.0		100.0	100.0	
FATHER'S EDUCATION									
Father did not graduate from high school	58.6	43.3	.05	47.3	30.6	.05	53.4	36.8	.001
Father graduated from high school but not from college	20.6	37.5	.05	30.5	41.9	n.s.	25.2	40.0	.01
Father a college graduate	20.6	19.1	n.s.	22.2	26.7	n.s.	21.4	23.2	n.s.
	99.8	99.9		100.0	99.2		100.0	100.0	

Religion

There were large and impressive differences in the religious preferences of the two groups. Substantially more of the Conservatives reported Protestant affiliation, while the Liberals more often were either Jewish or reported no preference. Roughly ten percent of both groups were Catholic.

Marital Status

Significantly more of the Conservatives were married and living with their original spouse. Thus the Liberals more often were single, or had been widowed, or divorced.

Socio-Economic Level

Significantly more of the Liberals had fathers who did not graduate from high school while the Conservatives more often had fathers who made it through high school but not college. There was no difference between the two groups in percentage of fathers who were college graduates; about one-fifth of each group reported that much education for their fathers.

Attitudes and Values

One section of the questionnaire was concerned with the individual's value orientation as measured by their attitudes toward modern art, conventionality in opinions and values, and degree of religiosity. Each individual was asked to place himself along a five-point continum dealing with each of the three areas. The choices ranged from very favorable toward modern art to very unfavorable. Analogous alternatives were presented for the other two variables. The data presented in Table46 indicate the percentages falling in the favorable, conventional, and religious categories, respectively, for the three dimensions.

Table 46

Comparison of Political Liberals and Conservatives on Attitudes and Values

Variables (In Percent)	MEN			WOMEN			TOTAL		
	Liberal N=91	Conservative N=136	Level of Signif.	Liberal N=72	Conservative N=150	Level of Signif.	Liberal N=163	Conservative N=286	Level of Signif.
Favorable to modern art	36.3	19.9	.001	47.2	27.3	.01	41.1	23.8	.001
Conventional in opinions and values	41.8	74.3	.001	43.1	73.4	.001	42.4	73.7	.001
Religious	61.5	76.4	n.s.	59.7	84.0	.001	60.7	80.4	.001
Most proud of occupational accomplishments	65.5	50.8	.05	17.1	12.2	n.s.	43.9	30.4	.01
Most proud of family accomplishments	29.9	40.1	n.s.	54.3	66.2	n.s.	41.0	53.9	.05

Two by five χ^2 tests indicated that all three variables were significantly related to political Liberalism-Conservatism. Whether both sexes were taken together or considered separately, Liberals were found to be more favorable toward modern art, more unconventional in opinions and values, and less religious.

In a further attempt to determine what the individual thought was important, another interview question asked, "Which of your accomplishments are you most proud of?" Answers were coded into the following categories:

1. Occupation
2. Marriage
3. Family
4. Avocation
5. Education
6. Friends
7. Religiosity
8. Nothing
9. Other

The majority of the sample reported greatest pride in either their occupational or family accomplishments, though there was a surprising difference between the two groups as to which of those areas they selected. A substantially higher percentage of Liberal males mentioned occupational success as the accomplishment of which they were most proud while Conservative males more frequently mentioned their family as the most satisfying aspect of their lives. The pattern, though not as dramatic and not statistically significant, was similar among the females.

Mental Health

Several questions were asked of the participants in an attempt to ascertain their current emotional adjustment. On the questionnaire, the subjects were asked whether or not they had ever gone to a psychiatrist or psychologist and, as reported in Table 47, a significantly higher percentage of Liberals responded positively to the question.

Table 47

Comparison of Political Liberals and Conservatives on Mental Health Variables

Variables (In Percent)	MEN Liberal N=91	 Conservative N=136	 Level of Signif.	WOMEN Liberal N=72	 Conservative N=150	 Level of Signif.	TOTAL Liberal N=163	 Conservative N=286	 Level of Signif.
FROM QUESTIONNAIRE									
Has gone to psychiatrist or psychologist	24.4	9.6	.01	25.4	12.8	.05	24.8	11.2	.001
FROM INTERVIEW									
Has gone to a professional person for help	34.9 (N=30)	22.0 (N=29)	n.s.	44.3 (N=35)	23.6	.01	39.1 (N=61)	22.8 (N=64)	.001
--Psychiatrist or Psychologist	70.0 (N=21)	48.3 (N=24)	n.s.	67.8 (N=21)	45.7 (N=16)	n.s.	68.8 (N=42)	46.9 (N=30)	.05
--Minister or Doctor	33.3 (N=10)	34.4 (N=10)	n.s.	25.8 (N=8)	59.9 (N=21)	.05	29.5 (N=18)	48.4 (N=31)	.05

In the interview, they were asked if they had ever gone to a professional person for help with any personal problems. Again, a significantly higher proportion of Liberals said they had sought professional help. When asked the sources of this help, a greater percentage of the Liberals said they had gone to a psychiatrist or psychologist, while those conservatives who had sought help were more likely to have gone to a minister or doctor.

The immediate conclusion to be drawn from these data is that the Liberals have exhibited more personal instability than the Conservatives but this may be too hasty. A more extensive discussion by Schofield (1964) indicates that the number of persons seeking help from professional psychologists or psychiatrists is a poor gauge of the amount of mental illness in a population. Other factors, such as income and education, are more closely related to the individual's decision to seek help. Rather than demonstrating more personal instability, the Liberal group may simply be more willing to utilize the services of professional people for emotional problems.

Scholastic Aptitude and Achievement

A distinction is drawn here--as is usually done in psychometric literature--between aptitude and achievement. Aptitude is presumably a more basic characteristic of the individual, less dependent on environmental experiences. Achievement, on the other hand, is more concerned with how well the individual has absorbed his education or training.

Several measures of scholastic achievement were available on each subject from his former University record. Following is a short description of each of them.

1. High School Rank (HSR)--rank in their high school class, expressed in percentiles.
2. College Grade Point Average (GPA)--calculated on whatever college work the individual had completed at Minnesota, based on a four point scale with A = 4.00.

3. Percent graduating from college--includes all individuals earning a four year college degree at any institution.
4. Percent earning graduate honors--any degree beyond the B.A., e.g., M.A., M.D., Ph.D.
5. Percent graduating with honors, i.e., Cum Laude, etc.--based on subject's self-report.
6. Percent on Dean's List for high scholastic achievement.
7. Percent earning Phi Beta Kappa recognition.

The data for the last three categories, and the degrees earned at institutions other than Minnesota, were taken from the questionnaire.

The results of these comparisons between the two groups are reported in Table 48.

There was little difference between the two groups on scholastic ability, though the difference between the two female groups was statistically significant at the five percent level, favoring the Liberal group.

However, on the scholastic achievement measures, there was a clear, consistent trend in favor of the Liberals. The Liberals performed better in high school, though not significantly, earned significantly better college grades, and ten percent more of them graduated from college as compared to the Conservatives. Furthermore, over twice as many Liberals received graduate degrees and graduated with honors. Three times as many Liberals as Conservatives made the Dean's List, and four times as many earned membership in Phi Beta Kappa, though the percentages in both of these last two categories were small.

Though approximately equal in ability, the Liberals consistently out-performed the Conservatives in scholastic settings. It is, of course, not clear whether there was any causal relationship operating here, i.e., whether success in educational settings makes one more Liberal or vice-versa.

Table 48

Political Liberals versus Conservatives on Scholastic Ability and Achievement Variables

Variable	MEN			WOMEN			TOTAL		
	Liberal N=91	Conservative N=136	Level of Signif.	Liberal N=72	Conservative N=150	Level of Signif.	Liberal N=163	Conservative N=286	Level of Signif.
SCHOLASTIC APTITUDE									
MSAT[1]									
Mean	57.5	58.3	n.s.	58.9	55.6	.05	58.1	56.9	n.s.
S.D.	13.4	10.0		11.5	11.8		12.5	11.1	
SCHOLASTIC ACHIEVEMENT									
High School Rank									
Mean	71.9	70.2	n.s.	83.7	78.7	n.s.	77.2	74.6	n.s.
S.D.	22.4	22.4		19.9	18.1		20.7	21.4	
College G.P.A.									
Mean	2.23	2.17	n.s.	2.50	2.11	.001	2.35	2.14	.01
S.D.	.78	.65		.74	.69		.77	.72	
Percent college graduates	70.3	65.2	n.s.	70.8	58.1	n.s.	70.5	61.2	.05
Percent graduate degrees	44.6	27.7	.01	17.8	3.9	.001	32.7	15.3	.001
Percent graduating with honors	12.8	5.8	n.s.	18.3	9.2	n.s.	15.1	7.6	.05
Percent on Dean's List	10.6	2.9	.05	5.6	3.3	n.s.	8.5	3.1	.05
Percent in Phi Beta Kappa	5.3	1.4	n.s.	9.9	2.0	.05	7.3	1.7	.01

1) MSAT = Minnesota Scholastic Aptitude Test

Achievement Since College

On the questionnaire, each individual was asked to complete a check-list of honors and awards earned since college. Although the categories were crude, and it was left up to the individual to decide what qualified as an award, differences still appeared between the two groups. Table 49 lists the categories of awards and the differences between the groups.

Table 49

Percentage of Liberals and Conservatives Having Received Awards and Honors Since Leaving College

MALE

Award	Liberals N=90	Conservatives N=135	Difference	Chi-Square
Miscellaneous Publications	15.6	3.0	+12.6	9.99**
Technical Publications	32.2	20.0	+12.2	3.69
Other Non-fiction Publications	12.2	3.7	+ 8.5	4.71*
Patents	5.5	.7	+ 4.8	3.15
Fiction	4.4	.7	+ 3.7	1.92
Drama	3.3	.0	+ 3.3	2.38
Other Awards	7.8	4.4	+ 3.4	.57
Art	3.3	.7	+ 2.6	.86
Civic Awards	14.4	14.1	+ .3	.01
Invitational Addresses	4.4	5.2	- .8	.004
Music	0.0	2.2	- 2.2	.69
Athletic	6.7	14.1	- 7.4	2.30
Armed Forces	13.3	21.5	- 8.2	1.89
Business	12.2	20.7	- 8.5	2.17

** Significant at .01 level of confidence
* Significant at .05 level of confidence

FEMALE

Award	N=72	N=150	Difference	Chi-Square
Miscellaneous Publications	11.1	4.0	+ 7.1	1.94
Other Non-fiction Publications	9.7	4.7	+ 5.0	1.34
Business Awards	4.2	3.3	+ .9	.005
Invitational Addresses	1.4	.7	+ .7	.05
Technical Publications	4.2	4.0	+ .2	.09
Fiction	.0	.7	- .7	.14
Drama	1.4	2.0	- .6	.04
Art	0.0	.7	- .7	.14
Music	0.0	.7	- .7	.14
Civic Awards	6.9	8.7	- 1.8	.03
Athletic	2.8	6.7	- 3.9	.78
Other Awards	6.9	14.7	- 7.8	2.04

The percentage listed for each category is the percentage reporting something other than "None".

For the men, only two of the percentage differences were statistically significant, and none of the differences for the women were significant. Nevertheless an interesting pattern did emerge, particularly among the men. The Liberals were more likely to have received awards for their writing activities while the Conservatives received more awards in athletics, the military services and business activities. Again, in their accomplishments, the Liberals were more oriented toward intellectual areas.

Another area of adult achievement is income. Each respondent was asked to report his total family income, including his (or her) spouse's income, income from investments, rental property, etc. The Conservative men reported a median income of $16,000, the Liberals $12,000, a difference significant at the one percent level. For the women, the difference was in the same direction but not statistically significant--Conservative women reported a median family income of $14,000, Liberals, $12,750.

From a financial standpoint, the Conservatives were clearly faring better than the Liberals.

In the earlier work on counseling effectiveness, an attempt was made to rate each subject on his overall contribution to society. The results of comparing the two political types on this rating are reported in Table 50.

Table 50

"Contribution to Society" Rating Between
Political Liberals and Conservatives

	MEN			WOMEN			TOTAL		
	Liberal	Conservative	Level of Significance	Liberal	Conservative	Level of Significance	Liberal	Conservative	Level of Significance
	N=91	N=136		N=72	N=150		N=163	N=286	
Mean	10.36	10.50		10.90	10.41		10.61	10.45	
S.D.	1.86	1.92		2.07	2.33		2.26	1.87	
t-value	-.57		n.s.	1.84		n.s.	.70		n.s.

On this global rating of achievement, there were no differences between the Liberals and Conservatives. Though the earlier results indicated mildly different patterns of achievement between the two groups, both groups--based on this rating--have contributed equally when all varieties of accomplishments are considered.

Vocational Interests of Liberals and Conservatives

As part of the counseling effectiveness study, most of the individuals in this research completed the Strong Vocational Interest Blank (SVIB) as adults in 1962. Scores of the Liberals and Conservatives were compared and differences larger than 4 points, all significant beyond the one percent level, are listed in Table 51. (The SVIB uses standard scores with a mean of 50 and standard deviation of 10.)

The themes running through the vocational interest differences are similar to the earlier findings. The Liberals had more interests in common with the social service occupations, with the arts and sciences, and with men and women in verbal-linguistic occupations. The Conservative men tended toward business activities and the more practical, typically masculine occupations while the Conservative women showed greatest similarity in interests with the more domestic, typically feminine occupations. In both sexes, the Conservatives leaned toward the practical, down-to-earth, traditional interests while the Liberals indicated more interest in the arty-cultural, intellectual areas, and in service toward others.

Table 51

SVIB Scale Differences Between Liberals and Conservatives

MEN	N = 87	N = 134	
Scale	Liberal Mean	Conservative Mean	Difference
Psychologist	35.9	24.1	11.8**
Musician	38.1	27.0	11.1**
Social Worker	39.2	29.6	9.6**
Minister	27.6	18.8	8.8**
Artist	26.9	19.2	7.7**
City School Superintendent	32.5	25.1	7.4**
Lawyer	38.2	31.3	6.9**
Author-Journalist	35.6	28.7	6.9**
Social Science HS Teacher	37.4	30.7	6.7**
Physician	33.9	27.9	6.0**
Advertising Man	37.4	31.6	5.8**
Mathematician	23.2	17.8	5.4**
Architect	27.0	21.6	5.4**
Farmer	26.0	29.9	-3.9**
Banker	26.5	30.5	-4.0**
President-Mfg. Concern	29.8	33.8	-4.0**
Engineer	24.1	28.1	-4.0*
Sales Manager	31.0	35.1	-4.1*
Forest Service Man	18.9	23.1	-4.2*
Aviator	25.8	30.1	-4.3*
Office Man	31.8	36.6	-4.8**
Production Manager	28.7	35.4	-6.7**
Accountant	26.3	33.1	-6.8**
Purchasing Agent	25.5	34.1	-8.6**
WOMEN	N = 72	N = 149	
Psychologist	34.8	24.6	10.2**
English Teacher	33.2	25.3	7.9**
Lawyer	34.0	27.2	6.8**
Social Worker	38.3	31.7	6.6**
Author	34.3	28.1	6.2**
Social Science Teacher	30.1	24.3	5.8**
Librarian	35.4	30.4	5.0**
Elementary Teacher	29.0	33.6	-4.6**
Nurse	24.5	29.4	-4.9**
Steno-Secretary	31.5	36.6	-5.1**
Housewife	33.4	38.9	-5.5**
Office Worker	30.8	37.0	-6.2**
Buyer	18.9	25.6	-6.7**
Dietitian	22.1	30.5	-8.4**
Home Economics Teacher	17.6	27.2	-9.6**

** Significant at .01 Level of Confidence
* Significant at .05 Level of Confidence

The analysis of the vocational interests of these samples was extended one step further; the responses of the Liberals and Conservatives to the items of the SVIB were tabulated to identify those items where the groups responded differently and those items were then collected into a Liberalism-Conservatism scale. Separate scales were prepared for both the Men and Women's form.

Specifically, items were included on the scales when at least one of the three possible response positions (Like-Indifferent-Dislike) showed a 17 percent or greater response frequency between the two criterion groups. (On the Men's Form, the item selection was restricted to the 298 items being retained in the 1965 revision of the SVIB. On the Women's Blank, all 400 items were used.) Forty-seven items met this standard for the Men's Blank, 54 for the Women's. The decision to select items in this manner was based on the work of Clark (1961). He has shown that scales with such characteristics are valid, reliable and hold up well under cross-validation.

Because these methods have been resistant to cross-validation shrinkage, no attempt was made to directly cross-validate these scales; rather all available subjects were used in the validation groups to increase the stability of the item selection procedures.

However, considerable validity generalization data have been collected. First, a group of current college freshmen, separated into the same two political criterion categories as used in the validation samples, were studied, and second, all of the SVIB occupational criterion groups were scored on these scales. The distributions of occupational group means provided considerable information about the scale characteristics.

Validity Results

The results from scoring the validation groups are reported in Table 52. As the items were weighted +1 when the Liberal group answered more frequently, and -1 when the difference favored the Conservatives, positive raw scores are in the liberal direction, negative raw scores in the conservative direction.

When scores are reported for the usual SVIB occupational scales, they are transferred into standard scores with a mean of 50 and a standard deviation of 10. A slight modification has been used with the L-C scales. By applying the following conversion to the raw scores, they have been transformed into a distribution where the Conservatives average approximately 40, the Liberals approximately 60, with a within-group standard deviation roughly equal to 10.

$$\text{L-C Standard Score} = \left[\frac{X - \left[\dfrac{M_L + M_C}{2} \right]}{\dfrac{SD_L + SD_C}{2}} \right] 10 + 50$$

Where X = Subject's raw score
M_L = Liberal Mean
M_C = Conservative Mean
SD_L = Liberal Standard Deviation
SD_C = Conservative Standard Deviation

For the Men's scale, $M_L + M_C/2 = -1.55$, and $SD_L + SD_C/2 = 7.6$. For the Women's scale, the analogous figures are -0.33 and 12.58.

This transformation provides a ready reference to the scores of the original Liberal and Conservative criterion groups.

Table 52

Validities of the Liberalism-Conservatism Scales

	MEN			WOMEN		
Criterion Groups	N	Mean	S.D.	N	Mean	S.D.
Liberals	87	60.0	11.9	69	58.8	10.7
		(5.7)*	(8.6)		(11.4)	(13.4)
Conservatives	134	40.0	9.1	149	40.2	9.3
		(-8.8)	(6.6)		(-12.1)	(11.7)
Percent Overlap		34			33	
Sub Groups	N	Mean	S.D.	N	Mean	S.D.
Very Liberal	30	64.3	11.6	21	62.0	9.8
Somewhat Liberal	57	57.7	11.4	48	57.4	10.7
Somewhat Conservative	98	39.9	9.1	120	41.2	9.3
Very Conservative	36	40.4	8.8	29	35.8	8.2

* Numbers in parentheses are raw scores; all others in standard score form.

The most important figures in Table 52 are those showing the percent overlap between the two contrasting groups. This statistic, suggested by Tilton, (1938), gives an indication of how many scores in one distribution can be matched by scores in the other. Complete separation would be indicated by zero overlap; complete similarity would show 100 percent overlap. The percent overlap is roughly twice the numbers of classification errors that would be made if the individual were assigned to one of the groups on the basis of his score on this scale, assuming the groups were equal in size and variability.

For the men, the overlap was 34 percent. For the women, the figure was 33 percent. These validity indices are of the same general magnitude as those for the regular SVIB occupational scales, and indicate that the L-C scales did a respectable job of separating the groups.

In the bottom half of Table 52, the Liberal criterion groups have been split according to whether the subjects described themselves as "Very Liberal" or only "Somewhat Liberal". The analogous split has been made in the Conservative groups. If the scales are operating as they should, the means should march in the desired direction within each sex. As the data indicate, with the exception of the male Conservative group, the means march. The scales were sensitive to this discrimination.

As discussed earlier, all of the available subjects were used in the validation groups and no cross-validation sample was studied. While the progression of the sub-group means in Table 52 provides some assurance that the differences are not based on chance, more substantial evidence was gathered through the study of other samples.

The first included men who entered Macalester College as freshmen in the fall of 1964. During their college orientation, they filled out the SVIB and a questionnaire which included both the 5-point scale of liberalism and conservatism and the question on political party preference. The same two categories used in the developmental samples were separated out and scored on the L-C scale. The N, mean, and standard deviation for each group, and overlap between the groups are reported in Table 53.

Table 53

Average Scores for Macalester College Freshmen Males

	N	M	S.D.
Liberal Democrats	61	56.0	11.9
Conservative Republicans	81	49.1	9.1

Percent Overlap 74

While the difference between groups was safely beyond the chance level ($t = 3.79$, $p < .001$) the magnitude of the separation was considerably less than among the adult criterion groups. Some of the decrease may have been caused by cross-validation shrinkage, but probably more was due to the nature of the sample. These students, about 18 years old, likely had less well-defined political attitudes and certainly, from what is known about the age of onset of stability in interests, had less stable vocational interests than the adult samples.

A second type of validity generalization data was gathered by scoring each of the SVIB occupational criterion groups on the L-C scales. These groups, which ranged in size from 101 to 1045 with a median of about 300, contained the individuals originally used to standardize the SVIB scales. The male groups are ordered according to their means, in the left hand column of Table 54 ; the women's groups are ordered in the right-hand column.

As can be seen, there were substantial differences between the group means, almost two standard deviations between the extremes.

For the most part, the ordering corresponded to the usual expectations. For the men's groups, the occupations toward the conservative end were mainly those from the business world. Policemen and Army Officers were also rated conservative by this scale as were farmers and veterinarians. These four groups all have a certain rugged, masculine flair and they share, with business men, common interests in things practical versus things intellectual, in the concrete versus the abstract.

Table 54

Occupational Mean Scores on the L-C Scales

M	Men Occupations	M	Women Occupations
59	Author-Journalist (248, 8.9)[1] Librarian (425, 10.4)	59	
58		58	
57	Social Worker (400, 10.9)	57	Author (385, 7.5)
56	Psychologist (1045, 9.7)	56	
55		55	Psychologist (378, 8.8)
54	Artist (231, 8.3) Minister (250, 9.3)	54	
53	Music Teacher (493, 10.6) Psychiatrist (404, 10.4)	53	
52	Mathematician (181, 8.1) Musician (450, 10.6)	52	Artist (385, 8.1) Librarian (417, 8.5)
51	Biologist (342, 9.8) Rehabilitation Counselor (272, 10.7) Social Science Teacher (217, 10.2)	51	Social Worker (464, 9.6) Physician (413, 8.6) Lawyer (369, 8.8)
50	Advertising Man (169, 10.2) Lawyer (251, 10.1) School Superintendent (190, 9.7)	50	English Teacher (291, 8.4)
49	Architect (240, 9.2)	49	
48	C.P.A. Owner (354, 10.3) Physicist (172, 8.0) YMCA Secretary (113, 9.1)	48	Social Science Teacher (392, 9.2)
47	Chamber of Commerce Executive (400, 10.0) Public Administrator (550, 11.9)	47	Life Insurance Saleswoman (200, 8.0) Engineer (322, 9.3) YWCA Secretary (197, 8.8) Musician (287, 9.6)
46	Physician (534, 10.4) Business Teacher (323, 10.3)	46	Dentist (187, 9.0)

Table 54 (Cont'd)

M	Men Occupations	M	Women Occupations
45	Math-Science Teacher (289, 8.8) Personnel Director (147, 10.5) Printer (270, 9.9)	45	
44	Physical Therapist (350, 9.5) YMCA Physical Director (216, 8.5) Life Insurance Salesman (310, 9.0)	44	Physical Therapist (449, 9.0) Music Teacher (444, 8.8) Math-Science Teacher (466, 8.5)
43	Chemist (297, 9.6) Pharmacist (309, 9.9) Real Estate Salesman (243, 9.4)	43	Laboratory Technician (350, 8.4) Nurse (386, 8.8) Occupational Therapist (162, 8.3)
42	Dentist (239, 8.4) Forest Service Man (406, 8.3) Osteopath (585, 9.0) Senior CPA (612, 9.4)	42	Buyer (196, 9.0) Steno-Secretary (447, 8.7)
41	Accountant (345, 9.7) Mortician (360, 9.4) President-Mfg. Concern (169, 9.1) Sales Manager (228, 9.1) Office Worker (326, 8.9)	41	
40	Army Officer (463, 9.2) Banker (247, 9.0) Credit Manager (452, 9.5) Engineer (513, 8.4)	40	Business Education Teacher (250, 7.8) Physical Education Teacher (101, 6.5) Dietitian (415, 8.4)
39	Farmer (241, 9.0) Policeman (254, 7.5) Production Manager (216, 8.3)	39	Office Worker (423, 7.8)
38	Carpenter (181, 7.5) Purchasing Agent (219, 8.4) Veterinarian (310, 7.8)	38	Home Economics Teacher (417, 7.6)
37	Airplane Pilot (510, 8.1)	37	

---

[1] (First number in parentheses is Group N; second number if group S.D.)

On the other end of the Men's scale, the Liberal end, were the intellectual and linguistic occupations. The Arts and Social Welfare occupations were present there also. The ordering makes it clear that the liberal end of the scale represented the intellectual portion of the Democratic party, not the labor bloc. On this scale, the 181 men in the carpenters group, an occupation traditionally oriented toward the Democratic party, had an average score far to the conservative end of the scale. This result probably occurred because the Democrats used in this study were mostly college graduates; there were very few blue-collar workers represented.

Among the women's groups, those at the conservative end were the occupations most closely concerned with "traditional domestic" activities, i.e., Home Economic Teachers and Dietitians, and also the business groups such as Buyers and Business Education Teachers. Women Physical Education Teachers, perhaps the closest analogy to the "rugged, masculine" occupations found at the conservative end of the men's scale, were also rated conservative by the women's scale.

The most liberal women occupations were the Authors, Psychologists, Social Workers, and Librarians, precisely the same as among the men's groups.

The variability within each of these occupations should be emphasized. The numbers in parenthesis in Table 54 include the standard deviation within each group. They averaged about 10, indicated that the men or women within each occupation were distributed over 50 or 60 points. The diversity within occupations is obvious, and should be stressed.

Reliability

The reliability of the men's scale was estimated by the use of two test-retest groups, the first with a thirty day interval, the second with a 22 year interval between testings. The first group included 102 individuals, most of whom were members of an Army Reserve unit, based at Fort Snelling, Minnesota. These men were roughly 25 years old, predominantly college-educated, and scattered across a variety of occupations though there was a fair concentration in the advertising and newspaper fields.

The second test-retest group included 199 former Stanford University students studied by E. K. Strong, Jr. (1955) over a 22 year interval, beginning when they were college seniors.

The reliabilities, means, and standard deviations for each group are reported in the next table. Note that both groups had mean scores approximately in the middle of the scale.

Table 55

Test-Retest Reliability--Men's Scale

Test-Retest	Test			Retest		
Interval	N	M	S.D.	M	S.D.	r_{t-r}
30 Day	102	[illegible]	[illegible]	51.2	12.1	.91
22 Year	199	50.1	9.5	47.9	11.0	.64

The scale showed respectable stability with test-retest correlations of .91 over 30 days and .64 over 22 years.

The means for the 30-day retest group remained stable, but the 22 year group moved toward the conservative end of the scale. Though the change was not great, about one-fifth of a standard deviation, it was enough to be statistically significant. These Stanford University graduates were slightly more conservative as adults than they were as college seniors.

No test-retest data are available on the Women's scale.

Item Content

Though inspection of the item content of empirically derived scales can be risky as it frequently leads to over-interpretation, it also can provide tentative explanations as to why the scales work, and can lead to hypotheses for further study.

In item preferences, the male Liberals tended toward the "arty" and intellectual items, the Conservatives toward the practical, business, and adventuresome activities. The business versus culture pattern appeared in the occupational titles where the Conservatives more often reported liking for "Building Contractor", "Factory Manager", "Manufacturer", "Stock Broker", and "Wholesaler". Conversely, the Liberals more often stated preferences for "Poet", "Newspaper Reporter", and "Sculptor".

The Conservative's well-known concern for fiscal responsibility was reflected in the items showing differences between the groups. More often than the Liberals, Conservatives liked "Thrifty people", "Saving money", "Being treasurer of a club", "People who have made fortunes in business," and reported they were less apt to loan money to acquaintances than were the Liberals.

The "intellectual versus practical" pattern was again reflected in the magazine preferences of the two groups, the Liberals more often preferring the New Republic and Atlantic Monthly, the Conservatives choosing Popular Mechanics. However, both groups reported greater preference for Time and the National Geographic than for any of the others.

This is perhaps an appropriate place to emphasize the similarity in interests of these two groups. People have more interests in common than they do differences--E. K. Strong, Jr. has pointed that out many times--and it was again established in this project. Of the several hundred items on the SVIB, large and substantial differences were found on only about 10 percent of the items. While it is these differences in interests that lead people to choose different occupations and different ways of life, (and interest inventories capitalize on these differences), the phenomenom of substantial communality of interests over all groups should not be overlooked.

It should also be emphasized here that these scales represent _differences_ between the Liberal and Conservative groups, not _absolute likes and dislikes_. For example, the response "Like to be an Explorer" was scored in the conservative direction; yet a majority of the Liberal men (51 percent) responded that way. It was scored in the conservative direction because substantially more Conservatives (73 percent) said they would like this occupation.

The differences in item responses between the women's groups indicated that Liberal women, like the men, were more likely to have interests along verbal and intellectual lines. Among the Conservatives, whereas the men tended toward practical or business activities, the women reported interests typical of the traditional feminine, homemaking role.

The cultural versus homemaking dichotomy was well demonstrated by differences in occupational and amusement preferences. Liberal women more often liked the occupations of "Dramatist", "Editor" and "Poet", while the Conservatives more often chose "Florist", Hostess", and Tea Room Proprietor".

For amusements, the Liberal women more often expressed preference for the magazines _Atlantic Monthly_ and _New Republic_ while the Conservatives preferred "Women's pages", "Romantic stories", "Afternoon teas" and the magazines, _National Geographic_ and _Reader's Digest_.

Personality and Occupation

This Liberalism-Conservatism scale demonstrates the close relationship between the individual's location on this dimension and the way that he chose to spend the majority of his waking hours, i.e., at work. Of course, there were wide differences within each sample, and it is by no means possible to accurately predict an individual's occupation from his score on the L-C scale, nor vice-versa. But a substantial relationship clearly exists.

The identification of such a dimension among a set of interest inventory items also provides considerable information about the stability of such attitudes. It has been well-established that the SVIB scale results are remarkably stable over periods as long as thirty years, (Strong, 1955; Campbell, 1965) and the Liberalism-Conservatism scale also has proved fairly reliable, with a test-retest correlation of .64 over a twenty-two year period. From all we know about the crystallization of interests the individual's responses to the items on the L-C scale, and presumably his corresponding attitudes, will not vary much after about age 25.

Liberals and Conservatives: A Summing Up

A variety of sociological and psychometric factors emerged as related to self-defined liberalism-conservatism. In summary fashion, the Liberal, as contrasted with the Conservative, could be characterized as more likely to:

1) be non-Protestant and less religious
2) have a father who did not graduate from high school
3) state he is favorable toward modern art
4) state he is unconventional in opinions and values
5) be proud of his occupational accomplishments
6) have gone to a psychiatrist or psychologist
7) have been a better student in college
8) have published more of his writing and have common interests with people in artistic, verbal, or social service occupations.

In contrast, the Conservatives were more likely to:

1) be Protestant and fairly religious
2) have a stable marriage
3) express pride in their family rather than their occupational achievements
4) report that they were conventional in attitudes and opinions
5) state distaste for modern art
6) have made contributions in the civic, business, or military areas; and have common interests with individuals in business or "masculine-oriented" occupations.

The nature and magnitude of these differences permits wide latitude in interpretation. One might say, "The overwhelming finding is that of only small and, for the most part, trivial differences between these groups. On the really important variables of basic ability and general achievement, the groups are identical." This approach would likely appeal to at least one great American. George Washington, in his Farewell Address, pointed out the dangers of seeing political differences where none exist and stressed that the goals of the leading political parties in America have more in common than in conflict.

> ". . .the common and continual mischiefs of the spirit of Party are sufficient to make it the interest and duty of a wise People to discourage and restrain it. . .it is certain there will always be enough of that spirit for every salutary purpose, and there being constant danger of excess, the effort ought to be, by force of public opinion, to mitigate and assuage it. A fire not to be quenched; it demands a uniform vigilance to prevent its bursting into a flame, lest, instead of warming, it should consume."

. . . The Farewell Address
1796

On the other hand, one could point out that despite the superficial nature of much of this information, despite the categorization based on only self-report, and despite the homogeneous distributions of the groups on variables such as geographic and ethnic origin, age, and educational background, consistent, meaningful differences persisted across several varieties of data, all indicating the same basic dichotomy: a traditional, practical, business, or domestic orientation versus an intellectual, cultural, social service viewpoint.

I do not care to make either too much or too little of this difference. It's there, it exists and, as a matter of fact, to some of the people involved, it's a highly significant fact in their way of life. A few individuals on both extremes, the illiberal Liberals and the radical Conservatives, expressed concern informally in the interview that the other end was taking us straight into an authoritarian state, Communistic as seen from one end, Fascistic from the other.

But, with the possible exceptions of the extremes, considerable overlap was noted on all variables. While we need to attend to the differences to understand these two political types, we shouldn't ignore the equally important phenomenon of substantial similarity.

LIST OF REFERENCES

1. Bayley, Nancy. On the growth of intelligence. *Amer. Psychol.*, 1955, 10, 805-819.

2. Berdie, R. F. & Hood, A. B. Trends in post-high school plans over an 11-year period. Cooperative Research Project #951, University of Minnesota, 1963.

3. Berdie, R. F., Layton, W. L., Hagenah, Theda, & Swanson, E. O. Who goes to college? *Minnesota Studies in Student Personnel Work*, 12, Minneapolis: University of Minnesota Press, 1962.

4. Brayfield, A. H., Wells, R. V., & Strate, M. W. Interrelationships among measures of job satisfaction and general satisfaction. *J. appl. Psychol.*, 1957, 41, 201-205.

5. Campbell, D. P. Achievements of counseled and non-counseled students twenty-five years after counseling. *J. couns. Psychol.* (in press).

6. Campbell, D. P. A counseling effectiveness study with a "better" control group. *J. couns. Psychol.*, 1963, 10, 334-339.

7. Campbell, D. P. A cross-sectional and longitudinal study of scholastic abilities over twenty-five years. *J. couns. Psychol.*, 1965, 12, 55-61.

8. Campbell, D. P. *Manual for the Strong Vocational Interest Blank for Men and Women*. Stanford University Press, (in press).

9. Campbell, D. P. The stability of interests within an occupation over 30 years. *J. appl. Psychol.*, (in press).

10. Campbell, D. P. Twenty-five year followup of educational-vocational counseling. Cooperative Research Project #1346, Office of Education, U. S. Department of Health, Education and Welfare, 1964.

11. Campbell, D. P. & Rossmann, J. E. A liberalism-conservatism scale for the SVIB. Unpublished manuscript, University of Minnesota. 1965.

12. Charles, D. C. Ability and accomplishment of persons earlier judged mentally deficient. *Genet. Psychol. Monogr.*, 1953, 47, 3-71.

13. Clark, K. E. Vocational interests of nonprofessional men. University of Minnesota Press, 1964.

14. Herzberg, F., Mauser, B., Peterson, E. D., & Capwell, D. F. Job attitudes: review of research and opinion. Pittsburgh: Psychological Services Pittsburgh, 1957.

15. Herzberg, F. & Russel, D. The effects of experience and change of job interest on the Kuder Preference Record. J. appl. Psychol., 1953, 37, 478-481.

16. Hoffman, Lois. The decision to work. In F. Ivan Nye & Lois W. Hoffman (Eds.) The employed mother in America. Chicago: Rand McNally & Co., 1963. 18-39.

17. Hoyt, D. P. & Kennedy, C. Interests and personality correlates of career-motivated and homemaking-motivated college women. J. couns. Psychol., 1958, 5, 44-48.

18. Jones, H. E. & Conrad, H. S. The growth and decline of intelligence. Genet. Psychol. Monogr., 1933, 13, 223-298.

19. Kilpatrick, F. & Cantril, H. Self-anchoring scaling: A measure of individuals' unique reality worlds. J. ind. Psychol., 1960, 16, 158-173.

20. Kloster, C. G. The relation between measured vocational interest and job satisfaction. Unpublished doctoral dissertation, University of Minnesota, 1956.

21. Laughlin, W. P. Changes of intelligence scores of college students over a period of approximately 4 years. Unpublished doctoral dissertation, University of Minnesota, 1940.

22. Martin, Ann. The development and successive refinement of an academic interest scale for the SVIB, Educ. Psychol. Meas., 1964, 24, 841-852.

23. McArthur, C. & Stevens, L. B. The validation of expressed interests as compared with inventoried interests: a fourteen year followup. J. appl. Psychol., 1955, 39, 184-189.

24. Miles, C. C. & Miles, W. R. The correlation of intelligence scores and chronological age from early to late maturity. *Amer. J. Psychol.*, 1932, 44, 44-78.

25. Mosier, C. I. Factors influenceing the validity of a scholastic interest scale. *J. educ. Psychol.*, 1937, 28, 188-196.

26. Owens, W. A. Age and mental abilities: A longitudinal study. *Genet. Psychol. Monogr.*, 1953, 48, 3-54.

27. Reynolds, L. G. & Shister, J. The worker's view of job opportunity. *Advanced Management*, 1948, 13, 170-177.

28. Roe, Anne. Satisfaction in work. *Amer. Assoc. Univ. Women J.*, 1962, 55, 230-232.

29. Rossmann, J. E. An investigation of maternal employment among college women--a twenty-five year followup. Unpublished doctoral disseration, University of Minnesota, 1963.

30. Rossmann, J. E. & Campbell, D. P. The employment of mothers who have been college trained. *Pers. Guid. J.*, 1965, 43, 986-992.

31. Rossmann, J. E. & Campbell, D. P. Vocational interests of employed and non-employed mothers. *Bull. Family Develop.*, 1965, 5, 1-8.

32. Sarbin, T. R. & Anderson, H. C. A preliminary study of the relation of measured interest patterns and occupation dissatisfaction. *Educ. Psychol. Meas.*, 1942, 2, 23-36.

33. Schofield, W. *Psychotherapy: the purchase of friendship*. Prentice Hall, New York, 1964.

34. Siegel, A. E. The working mother. *Amer. Assoc. Univ. Women J.*, 1962, 55, 233-235.

35. Sobol, Marion G. Commitment to work. In F. Ivan Nye & Lois W. Hoffman (Eds.) *The employed mother in America.* Chicago: Rand McNally & Co., 1963, 40-63.

36. Strong, E. K., Jr. *Manual for Strong Vocational Interest Blank for Men and Women.* Palo Alto: Consulting Psychologists Press, Inc., 1959.

37. Strong, E. K. Jr. *Vocational interests 18 years after college.* University of Minnesota Press, 1955.

38. Super, D. E. *Avocational interest patterns.* Stanford University Press, 1940.

39. Super D. E. Avocations and vocational adjustment. *Character & Personality,* 1941, 10, 51-61.

40. Super, D. E. & Crites, J. O. *Appraising vocational fitness.* New York: Harper & Bros., 1962.

41. Swanson, E. O. A followup study of college trained versus non-college trained high school graduates of high ability. Unpublished doctoral dissertation, University of Minnesota, 1953.

42. Terman, L. M. *Psychological factors in marital happiness.* New York: McGraw-Hill, 1938.

43. Terman, L. M. & Oden, M. H. *Genetic studies of genius.* Vol. V, Stanford University Press, 1959.

44. Tilton, J. W. The measurement of overlapping. *J. educ. Psychol.,* 1938, 656-662.

45. Troxell, J. P. Elements in job satisfaction: a study of attitudes among different occupational and status groups. *Personnel,* 1954, 31, 199-205.

46. Weitz, J. A neglected concept in the study of job satisfaction. *Personnel Psychol.,* 1952, 5, 201-205.

47. Williamson, E. G. A further analysis of the Young-Estabrooks studiousness scale. *J. appl. Psychol.,* 1938, 22, 105-106.

48. Williamson, E. G. An analysis of the Young-Estabrooks studiousness scale. *J. appl. Psychol.,* 1937, 21, 260-264.

49. Williamson, E. G. & Bordin, E. S. Evaluating counseling by means of a control-group experiment. _School & Society_, 1940, 52, 434-440. Also in Brayfield, A. H. (Ed.) _Readings in modern methods of counseling_. New York: Appleton-Century-Crofts, 1950, 511-520.

50. Woods, W. A. Employee attitudes and their relation to morale. _J. appl. Psychol_., 1944, 28, 285-301.

51. Young, C. W. & Estabrooks, G. H. Report on the Young-Estabrooks studiousness scale for use with the Strong Vocational Interest Blank for Men. _J. educ. Psychol._, 1937, 28, 176-187.

52. Young, C. W. & Estabrooks, G. H. _Scale for measuring studiousness by means of the Strong Vocational Interest Blank for Men_. Stanford University Press, 1936.

APPENDIX A

In the initial planning of this proposal, I had intended to study several other topics, including parent-child relationships on ability and achievement variables, and the characteristics of migrants to different parts of the country.

A substantial amount of work was devoted to these two subjects but the research was not carried through to fruition, either because the initial results showed little promise, or because time ran out on this project.

Because the statistical analysis have been completed, I am reporting the results in this Appendix but with no attempt to integrate the results with what has gone before.

I. Parent-Child Relationships on Ability and Achievement Variables

Many of the subjects in the twenty-five year followup now have teenage children attending Minnesota high schools. Those children were identified and the relevant information concerning their scores on the MSAT and their high school ranks were gathered for comparison with their parents.

The data are presented in Table 56 .

Table 56

Parent-Child Relationships on Ability and Achievement Variable

	N	M	S.D.	HSR (Parent)	HSR (Child)	MSAT (Parent)	MSAT (Child)	ACE (Parent)
HSR (Parent)	242	74	21.8		.24	.48	.21	.31
HSR (Child)	232	66	25.4			.26	.62	.39
MSAT R.S. (Parent)*	236	55	10.6				.36	.75
MSAT R.S. (Child)***	215	46	14.4					.53
1936 ACE (Parent)**	59	210	46.3					

* Taken at Age 45
*** Taken as High School Junior
** Taken as entering University of Minnesota Freshman

The following points merit comment:

1. About 242 parent-child pairs were collected.

2. The correlation between the adult-child test scores was higher for the test completed when the adult was a teenager (parent 1936 ACE versus child MSAT r = .53) than for the test completed when the parent was an adult (parent 1962 MSAT versus child MSAT r = .36). However, several technical weaknesses in these comparisons might be accounting for these results, specifically the greater variability of the ACE compared to the MSAT.

3. The correlation between parent's HSR and child's HSR was .24; the parent's average HSR was 74 compared to 66 for the children. However, using data not reported in the table, the average percentile rank for the parents on the college aptitude test was 62, the children 71. So many factors cloud those comparisons that any conclusions are dangerous.

II. Migration, Ability, and Achievement

Because we were so successful in locating and collecting information from the total sample that we set out to study, I was intrigued with the possibility of studying migration patterns among these individuals. In an attempt to do this, the data were organized as in Table 57 .

As the reader can see, it is very difficult to see any trends, usually because the samples were not large enough. Several comments might be made, all based on other knowledge from this study as well as the data in the migration table.

> First, the individuals returning to out-state Minnesota had a disproportionately large share of professional degrees and represent the doctors, dentists, and lawyers of the state.
>
> Second, while the number is quite small, those individuals migrating to Washington, D. C., and now in the Federal Government, include some of the most capable individuals in the study. That's reassuring.
>
> Third, the movement of all of these people has been into urban areas; hardly any of them now live in rural areas.
>
> Fourth, the migration of the brightest people in this sample has most frequently been to other colleges and universities.

Table 57

Migration, Abilities, and Achievements

Location	N	Percent	College Aptitude Test Percentile	College Grade Point Average	High School Rank	4 Year Degrees		Advanced Degrees	
						N	Percent	N	Percent
MINNESOTA	363	47.5	61	2.10	73	185	52	52	14
Twin Cities	319	41.8	60	2.09	72	160	51	43	13
Outstate	44	5.7	63	2.14	78	25	56	9	20
NEW ENGLAND	12	1.6	69	2.09	82	4	33	1	8
Connecticut	1	.1*							
Maine	1	.1							
Massachusetts	7	.9							
New Hampshire	1	.1							
Rhode Island	2	.3							
MID-ATLANTIC	28	3.6	72	2.36	77	19	68	6	21
New York	16	2.1	74	2.35	76	12	75	4	25
Pennsylvania	7	.9							
New Jersey	5	.7							
SOUTHERN ATLANTIC	24	3.1	61	2.38	77	15	62	6	25
Tennessee	2	.3							
Washington, D.C.	22	2.9	66	2.41	77	15	68	5	22
W. Virginia	1	.1							
North Carolina	1	.1							
Virginia	12	1.6	60	1.96	70	5	42	0	0
Maryland	8	1.0							
DEEP SOUTH	4	.5	72	2.01	68	2	50	1	25
Alabama	3	.4							
Georgia	1	.1							
FLORIDA	7	.9							
EASTERN MIDWEST	60	7.8	59	2.25	76	38	63	6	10
Ohio	13	1.7	59	2.34	79	5	38	1	8
Indiana	4	.5							
Michigan	11	1.4	64	2.30	79	9	82	2	18
Missouri	8	1.0							
Illinois	24	3.1	54	2.20	76	16	67	2	8
UPPER MIDWEST	45	5.9	64	2.30	80	26	58	6	13
Wisconsin	14	1.8	69	2.30	84	9	64	1	7
Iowa	7	.9							
North Dakota	9	1.2							
South Dakota	5	.7							
Montana	2	.3							
Nebraska	4	.5							
Kansas	4	.5							

Table 57 (Cont'd)

Location	N	Percent	College Aptitude Test Percentile	College Grade Point Average	High School Rank	4 Year Degrees		Advanced Degrees	
						N	Percent	N	Percent
SOUTHWEST	38	5.0	63	2.30	77	22	58	3	8
Oklahoma	3	.4							
Texas	10	1.3	63	2.40	75	7	70	0	0
Arizona	9	1.2							
New Mexico	4	.5							
Colorado	7	.9							
Nevada	2	.3							
Utah	3	.4							
PACIFIC NORTHWEST	18	2.3	65	2.00	75	7	38	1	6
Washington	10	1.3	64	2.00	82	4	40		
Oregon	8	1.0							
CALIFORNIA	116	15.1	65	2.20	71	61	52	13	11
(Los Angeles)	70	9.1	65	2.20	72	36	51	8	11
(San Francisco)	26	3.4	75	2.10	72	12	46	2	7
HAWAII	3	.4							
ALASKA	1	.1							
FOREIGN	12	1.6	77	2.20	76	7	58	0	0
South America	3	.4							
Europe	5	.7							
Africa	1								
Asia	2								
Australia	1								
DECEASED	31	4.0	59	1.80	56	10	32	2	6
UNLOCATED	5	.6	78	1.60	49	0	0	0	0
TOTAL	767	100.	63	2.14	73	396	52	97	13

* No statistics are reported for N's less than 10.